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PILOT DECISION-MAKING TRAINING

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The effectiveness of a simulator-based approach to training pilot skills in risk assessment and decision making was evaluated in a sample of pilots enrolled in a university aviation science program. Experimental group subjects received 4 hours of classroom instruction designed to enhance pilot judgment skills, followed by 4 hours of simulated cross-country flights during which several critical in-flight events occurred. Subjects in the control group received classroom instruction in basic instrument flying, followed by simulator sessions emphasizing instrument flight. Measures of pilot judgment were obtained on all subjects before and after the training, and subjects in the experimental judgment-trained group performed significantly better on the post-training simulation than did control group subjects. The findings suggest that significant gains in pilot decision-making skill can be obtained through the use of the judgment training materials along with simulator practice. The implications of these findings for Air Force undergraduate pilot training are discussed. Included as an appendix to this document is a prototype manual for pilot decision making. This manual is designed for use by Air Force student pilots as part of their regular training program. A specific plan for implementation is proposed. At a later date, similar advanced training materials may be developed for both simulator and in-flight use.

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SUMMARY

Experience is an expensive teacher when the subject is aeronautical decision making. For this reason, it is desirable to determine the feasibility of training pilots, via simulation, in risk assessment and judgment. However, a unified methodology for fostering the acquisition of good judgment and decision-making skills has never been developed, and little research has been done to identify the most efficient environments for gaining such experience. The present effort was therefore concerned with the use of a flight simulator in the training of pilot decision-making skills.

Twenty-nine subjects were randomly selected from among Aeronautical Science students enrolled in a Principles of Flight Instruction course at Embry-Riddle Aeronautical University. At the outset of the experiment, all subjects held a Private Pilot Certificate with an Airplane Single Engine Land Rating. Three control group subjects and six subjects in the experimental group also held multiengined ratings. Subjects were randomly assigned to either the experimental (N = 16) or control group (N = 13).

The experimental design compared the performance of 16 pilots who received classroom instruction and simulator training in aeronautical decision making with that of 13 subjects trained under a control condition which focused on basic instrument flying. Before and after this training, subjects in both groups were evaluated on simulated cross-country visual flight rules (VFR) flights. The results provide an exceptionally clear demonstration of the effectiveness of the simulator-based judgment training program. Subjects who received four hours of classroom instruction in risk assessment and decision making, followed by four instructional simulations in which they experienced several critical in-flight events, performed significantly better than did control group subjects when both groups were later evaluated on their handling of such events. This suggests that effective judgment training can be accomplished without reliance upon actual aircraft flight time.

A proposed syllabus, teaching outline, and training manual are provided in the Appendices.

PREFACE

This paper reports a portion of the research and development (R&D) program of the Air Force Human Resources Laboratory (AFHRL) for the Training Technology Program. The general objective of this program is to identify and demonstrate cost-effective strategies and new training systems to develop and maintain safety of flight and combat readiness. More specifically, the effort was part of the R&D conducted under the aegis of Aircrew Training Technology, which has as its aim the provision of a technology base for improving the effectiveness and efficiency of training aircrews. This research was supported by the Air Force Office of Scientific Research (AFOSR) as part of their summer faculty program. The purpose of this particular work was to optimize and validate an approach to training pilots to make sound judgments and decisions regarding flying tasks.

FOREWORD

This paper is submitted in fulfillment of the terms of the "Research Initiation Grant Program." This represents a full report on a research effort to optimize and validate an approach to pilot judgment training produced at the Air Force Human Resources Laboratory (AFHRL), Williams AFB, Arizona, during the 1985 USAF-UES "Summer Faculty Research Project."

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I. INTRODUCTION

In the many critical work roles assigned to the modern Air Force pilot, there is often insufficient time or opportunity to acquire and perfect decision-making skills through experience alone. Although limited fuel supplies, equipment availability, and the high cost of missions have placed increasing constraints on the flight time for training purposes, the military pilot of today must nonetheless be ready to perform with flawless precision on his operational assignment. In effect, he must develop good risk assessment and decision-making skills during a short period of training rather than over months or years of experience. Moreover, normal attrition in recent years has further reduced the experience level of pilots throughout the military. Following the Viet Nam conflict, a high percentage of U.S. military pilots had flown in actual combat; today, that same percentage has never seen combat.

The Air Force responded to this need by providing flight personnel with realistic experiences in the form of exercises such as Operation Red Flag, in which pilots fly in a hostile environment against other pilots who have been specially trained in aggressor tactics. But a unified methodology for fostering the acquisition of good judgment and decision-making skills has never been developed, and little research has been done to identify the most efficient environments for gaining such experience.

Statistics on both military and civilian aviation accidents clearly demonstrate that the majority of aircraft accidents are attributable to "pilot error." In most cases, this error is one of risk assessment and/or decision making -- pilot judgment. Although pilot judgment is a factor in every flight situation, it is of the greatest concern in those situations in which complex tasks are carried out under conditions of uncertainty, time pressure and stress (Brecke, 1982; Jensen, 1982). Pilot judgment has been defined as:

> ...the mental process by which the pilot recognizes, analyzes, and evaluates information regarding himself, the aircraft, and the outside environment. The final step in the process is to make a decision pertaining to the safe operation of the aircraft and to implement the decision in a timely manner. (Berlin, Gruber, Holmes, Jensen, Lau, Mills, & O'Kane, 1982, p. 4)

The need for a more flexible approach to pilot judgment training was recognized in the Air Force more than a decade ago with the implementation of the Situational Emergency Training (SET) program (Thorpe, Martin, Edwards, & Eddowes, 1976). Later, high-fidelity full-mission flight simulation, known as Line-Oriented Flight Training (LOFT) was employed for training pilots who serve in multicrew environments (Lauber & Foushee, 1981). Cockpit Resource Management (CRM) is another model for aircrew training which was built upon the basic LOFT paradigm. CRM focuses on decision making and crew coordination (Cooper, White, & Lauber, 1979), and has now become a major component in the training programs for air carrier and military transport personnel.

During this period too, the utility of special training programs to improve civilian pilot judgment was demonstrated in a series of carefully planned investigations. Following an FAA-supported study which concluded that faulty pilot decisional activities were involved in 35% of all fatal general aviation accidents and in 52% of all non-fatal accidents, researchers at Embry-Riddle Aeronautical University (ERAU) produced prototype judgment-training materials for student and instructor pilots. Using an observation flight protocol to measure pilot judgment, the ERAU group demonstrated that these materials could be effective in improving pilot decision making (Berlin et al., 1982).

An independent evaluation of these training materials was subsequently carried out in Canada using a sample of civilian Air Cadets. In this study too, subjects who received judgment training did significantly better on the observation flight than did control subjects (Buch & Diehl, 1983). While these studies employed classroom instruction in the judgment-training concepts along with coordinated in-flight activities, a second Canadian study demonstrated that the use of self-paced student manuals alone could also result in a significant improvement in observation flight performance (Buch & Diehl, 1984).

A recent field study conducted at Fixed Base Operator (FBO) flight schools used subjects more representative of the general population of student pilots (Lester, Diehl, Harvey, Buch, & Lawton, 1986). Also, in this experiment, subjects who received the judgment training did significantly better on the observation flight than did control group subjects.

However, with the sole exception of the one Canadian study which used only the self-paced student manual, all of these investigations have used a coordinated series of in-flight exercises to complement the classroom teaching of risk assessment and decision making. Given the high cost of actual flight time, particularly in high-performance military aircraft, it was felt that an alternative approach was needed. The present study was therefore concerned with the use of a flight simulator in the training of pilot decision-making skills. The intent was to model, as faithfully as possible, the simulator-training environment provided within the Air Force's Undergraduate Pilot Training (UPT) program. Within this simulated environment it was hypothesized that the experimental judgment-training course would improve pilot decision-making skills.

II. METHOD

Subjects

The subjects were randomly selected from among Aeronautical Science students enrolled in a Principles of Flight Instruction course at ERAU. At the outset of the experiment, all subjects held a Private Pilot Certificate with an Airplane Single Engine Land Rating. Three control group subjects and six subjects in the experimental group also held multiengined ratings.

Subjects were randomly assigned to either the experimental or control group. There was no significant difference between the experimental and control group either in age (T = 0.93, DF = 27) or flight experience (T = 1.06, DF = 27). The number of subjects in each group, their mean age, and mean flight experience are shown in Table 1.

Table 1. Sample

	Experimental group	Control group
Number of Subjects	16	13
Age (years)	20.9	21.2
Flight Experience (hours)	197.3	203.0

Procedure

The experimental design compared the performance of 16 pilots who received classroom instruction and simulator training in aeronautical decision making with that of 13 subjects trained under a control condition which focused on basic instrument flying. Before and after this training, subjects in both groups were evaluated on simulated cross-country visual flight rules (VFR) flights. All simulated flights were conducted in the generically configured cockpit of a Singer-Link GAT-1 two-axis simulator with movable pedestal. The simulator provided no visual depiction.

Before beginning their training, subjects in the experimental group completed a 10-item self-assessment pilot attitude inventory. This instrument is a modified form of the "Pilot Decisional Attribute Questionnaire" and yields scores that presumably reflect the relative strength of each of the five hazardous thought patterns. The four hours of classroom instruction were based on the Aeronautical Decision Making for Instrument Pilots text (Jensen & Adrion, 1984) and emphasized the hazardous thoughts. This instruction was followed by four simulator training sessions conducted by full-time ERAU flight instructors who had volunteered for the project. Each instructor had received eight hours of special training on the hazardous thought patterns and on the procedures to be used during the simulator training. The simulator flights were all VFR cross-country trips during which several critical events occurred. The instructors selected one of four possible routes of flight for each session. No flight scenario or critical event was used twice. The specific events used for each subject were selected by the instructors on an ad hoc basis from among those listed in Table 2. The duration and complexity of the flights increased systematically over the course of the four simulator flights as shown in Table 3.

Table 2. Critical In-Flight Events

A.	Destination airport closed due to an accident
B.	Severe turbulence
C.	Drop in oil pressure; no change in oil temperature
D.	Departure field goes Instrument Meteorological Conditions (IMC)
E.	Suction failure; A1 and H1 inoperative
F.	Loss of navigation station signal
G.	Loss of two-way radio communication
H.	Pilot-static system failure
I.	Partial loss of engine power
J.	Radar contact lost during radar vectoring
K.	Low fuel
L.	Flight vectored into restricted area
M.	30-minute delay for landing upon arrival at destination airport
N.	Pilot Controlled Lighting (PCL) inoperative upon arrival at destination airport
O.	Pilot given vectors opposite the desired direction of flight
P.	Pilot cleared to take off immediately behind B-727
Q.	Pilot advised Flight Service Station (FSS) does not have copy of flight plan
R.	Scattered cloud deck at cruising altitude
S.	Smoke or burning odor in cockpit

Table 3. Training Simulations for Experimental Group

Flight No.	Duration (mins)	Critical events
1	15	2
2	30	4
3	45	6
4	60	8

Subjects in the control group received four hours of classroom instruction on basic instrument flying from the same ERAU faculty member who taught aeronautical decision making to the experimental group. They also participated in four instrument flight simulator training sessions. These sessions followed the same time schedule and were conducted by the same flight instructors who conducted the simulator training for the experimental group.

The performance of subjects in both groups was evaluated on flight simulations administered before and after the training. Before beginning these pretest and posttest simulations, each subject was reminded that he was to act as the pilot-in-command of a night cross-country VFR flight which was to be conducted as a LOFT exercise, "exactly like an actual flight." No information other than the route of flight was provided unless specifically requested by the subject.

During the pretest flight, each subject pilot experienced three critical events in sequence: (a) the failure of all navigation reception while outbound from the departure airport Very High Frequency Omni-directional Radio (VOR); (b) changing weather conditions which resulted in both the departure and destination fields dropping below VFR minimums; and (c) the failure of all communication receivers. The posttest flight was similar to the pretest, but included three critical events which had not previously been used in the training with that particular subject. In addition, the noise level and turbulence were increased progressively during this flight in order to increase pilot stress.

Two performance measures were obtained on the pretest and posttest flights. At the time of the flight itself, the experimenter completed a 10-item checklist of decisional activities performed by the subject during the flight. These items appear in Table 4. This procedure yielded a score which could range from 0 to 10 for each subject. A second measure of performance was obtained by having each subject's record from both the pretest and posttest flights independently evaluated by five raters who were not involved in the study and were unaware of the details of the experimental design. All raters were Certified Flight Instructors and Designated Examiners. Three held Airline Transport Pilot Certificates and two held Commercial Pilot Certificates. The raters had no way of knowing whether a record came from a subject in the experimental or control group, or whether the flight represented a pretest or posttest simulation.

Table 4. Checklist of Pilot Decisional Activities

1. Requested preflight weather briefing
2. Activated flight plan
3. Checked fuel
4. Requested radar advisories
5. Checked weather enroute
6. Accurately computer Estimated Time of Arrival (ETA) for first intersection
7. Activated flight plan to alternate field
8. Initiated Dead Reaching navigation (DR) procedures following equipment failure
9. Elected cruise altitude above Minimum Enroute Altitude (MEA)
10. Requested assistance and/or confessed problems

Using both a graphic record of the flight and the checklist described above, raters assigned a score ranging from -5 to +5 to each flight. A rating of +5 indicated the "best possible judgment," whereas a rating of -5 was applied to the "worst possible judgment." Raters were instructed to base the ratings on their expectations for an average general aviation pilot with 200 hours of flight experience. They were specifically cautioned to avoid evaluating the "skill" of the pilot.

III. RESULTS AND DISCUSSION

The effects of the special training were examined using both the checklist scores and the median flight ratings as indices of change. Random assignment was effective in equating the experimental and control groups at the outset of the experiment. There was no significant difference between the experimental and control groups in either pretest checklist scores ($T = 0.43$, $DF = 27$) or in ratings of the pretest flight ($T = 0.38.$, $DF = 27$). These data are shown in Table 5.

Table 5. Pretest Checklist Scores and Flight Ratings

	Experimental group (N = 16)		Control group (N = 13)	
	Mean	SD	Mean	SD
Checklist Score	4.06	1.53	4.31	1.49
Flight Rating	-2.75	1.48	-2.92	0.76

An examination of the posttest flight records revealed a highly significant difference between the experimental and control group on both measures of the dependent variable. Both checklist scores ($T = 8.41$, $DF = 27$) and flight ratings ($T = 4.57$, $DF = 27$) indicated that the experimental group performed significantly better on the posttest than did the control group. These data are shown in Table 6. The pretest and posttest checklist data for both groups are depicted graphically in Figure 1. The flight ratings data are shown in Figure 2.

Table 6. Posttest Checklist Scores and Flight Ratings

	Experimental group (N = 16)		Control group (N = 13)	
	Mean	SD	Mean	SD
Checklist Score	8.63	1.50	3.46	1.81
Flight Rating	+1.63	2.80	-2.54	1.90

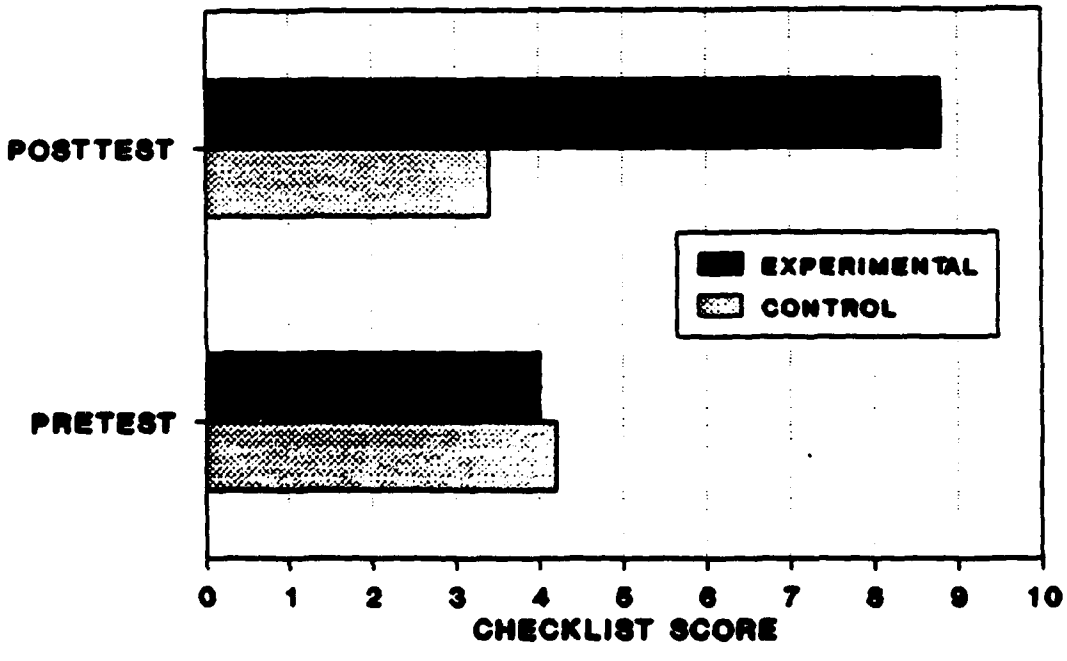

Figure 1. Pretest and posttest checklist scores.

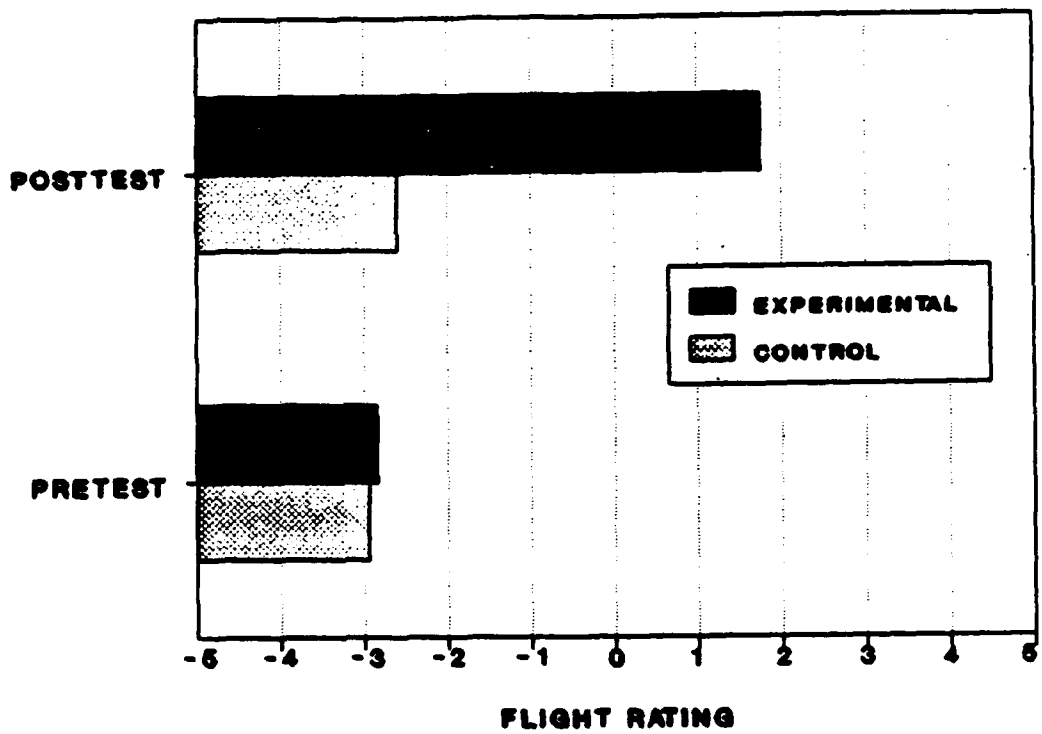

Figure 2. Pretest and posttest flight ratings.

A somewhat more sensitive measure of change is provided by using each subject as his own control and examining the changes in the dependent variable measure from pretest to posttest. This change score reflects a highly significant difference between the experimental and control groups with respect to both checklist scores ($T = 7.39$, $DF = 27$) and flight ratings ($T = 5.14$, $DF = 27$). Compared with the control group, the experimental group evidenced a significantly greater amount of change on both variables following training. These data are shown in Table 7 and illustrated graphically in Figure 3.

Table 7. Changes in Checklist Scores and Flight Ratings

	Experimental group (N = 16)		Control group (N = 13)	
	Mean	SD	Mean	SD
Checklist Score	+4.56	1.86	-0.85	2.08
Flight Rating	+4.38	2.42	+0.39	1.56

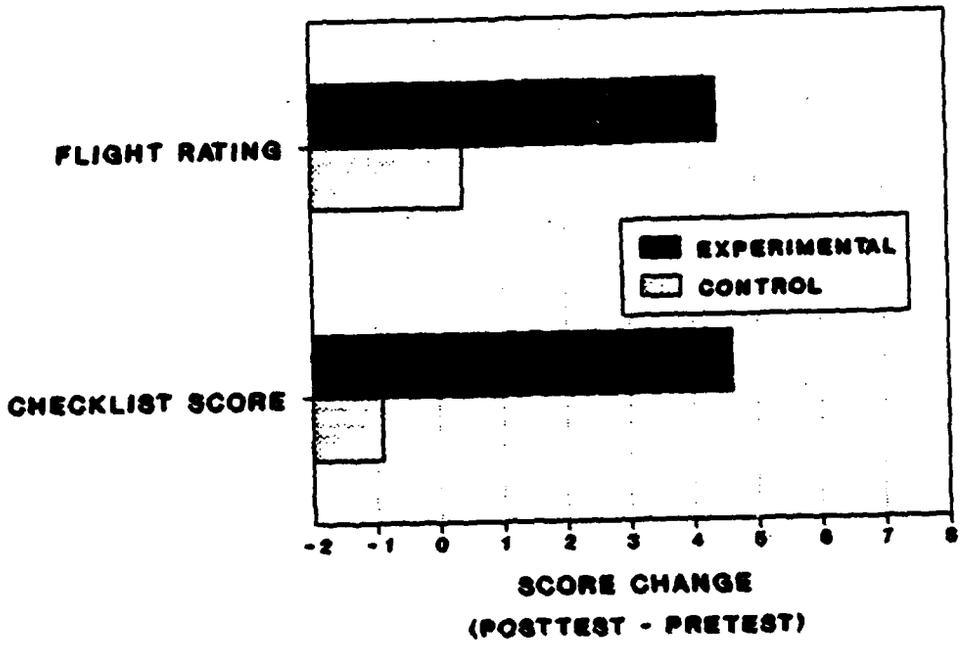

Figure 3. Changes in checklist scores and flight ratings following training.

IV. IMPLICATIONS AND CONCLUSIONS

The results provide a demonstration of the effectiveness of the simulator-based judgment training program. Subjects who received four hours of classroom instruction in risk assessment and decision making, followed by four simulated flights in which they experienced several critical in-flight events, performed significantly better than did control group subjects when later evaluated on their handling of such events. This suggests that effective judgment training can be accomplished without reliance upon actual aircraft flight time.

Moreover, the research also demonstrated that the judgment training program can be used effectively with pilots who are beyond the initial stages of their training. In contrast to previous investigations, all of the subjects in the present experiment were well beyond the Private Pilot Certificate when they began their training. The manual used herein was designed for students who are beginning their instrument training, and is more appropriate to the Air Force UPT Program than earlier versions of civilian pilot judgment-training materials.

Thus, the author recommends that the judgment-training model tested in this research, along with classroom instruction and flight simulation training in the use of good risk-assessment and decision-making skills in the handling of critical in-flight events, be incorporated into the Air Force UPT Program.

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APPENDIX A

JUDGMENT TRAINING SYLLABUS

Each lesson of the Judgment Training syllabus which follows sets forth a unit of classroom instruction or a unit of simulator instruction. Neither the time nor the number of periods to be devoted to each lesson is specified -- only recommended. The test project devoted four hours of classroom instruction to Lesson 1, and 2 hours 30 minutes (4 sessions) to Lesson 2.

Each lesson includes an Objective, Content and Completion Standard.

Lesson No. 1

(Recommend four hours of instruction)

Objective

Traditional pilot training emphasizes the pilot's knowledge about the aircraft and the flight environment. Judgment training focuses on the pilot's additional need for accurate and complete self-knowledge. The success of this training course thus greatly depends upon teaching the student to think more carefully and thoroughly about personal attitudes and behaviors.

Upon completion of this lesson and when presented with a series of true flying situations, the pilot will be able to identify hazardous thought patterns and substitute thoughts which promote good judgment. Additionally, the pilot will define the factors causing stress, explain the effects of stress on performance and outline strategies for overcoming high stress which reduces judgment-making abilities.

Content: (Student should read and complete the entire Aeronautical Decision Making for Instruments Pilots during this lesson.)

1. Pilot Decisional Attitude Questionnaire (PDAQ).

2. Aeronautical Decision Making.

    a. The pilot judgment problem
    b. Relationship of judgment to training
    c. Attitudes in decision making
    d. The poor judgment chain
    e. Antidotes for hazardous thoughts

3. Influences and resolution of stress.

    a. Define stress
    b. Factors causing stress and effects of stress
    c. Coping with stress

Completion Standard

The lesson will have been successfully completed when the student can accurately, 100% of the time, identify the hazardous thought contained in five given flight situations and apply the appropriate antidote. Additionally, the student will formulate a strategy for coping with stress consistent with the techniques outlined in the Aeronautical Decision Making for Instrument Pilots manual.

Lesson No. 2

(Recommend five simulated flights - including the evaluation flight)

Objective

When given a solo cross-country flight in the simulator, the pilot will demonstrate stress-coping techniques and good decision-making strategies for dealing with preprogrammed critical in-flight events.

Content

This lesson should be completed using a series of simulated flights as follows:

Flight No. 1 - 15 min. - 2 critical events

Flight No. 2 - 30 min. - 4 critical events

Flight No. 3 - 45 min. - 6 critical events

Flight No. 4 - 60 min. - 8 critical events

Flight No. 5 - 60 min. - 8 critical events

The flights and critical in-flight events should be selected from a prepared Teaching Outline (see Appendix B), and once used should not be repeated until Flight No. 5. Flight No. 5 should involve a combination of events different from those used in Flight No. 4. Each flight should be conducted as a full-mission simulation (FMS) which lies at the high end of the range of fidelity associated with mission-oriented simulation (MOS).

1. Preflight discussion.

    a. Provide departure point, route and destination for the planned flight.

    b. Pilot should use actual data for that day in planning the flight.

2. Simulated flight.

    a. Critical in-flight events as selected by the instructor.

3. Postflight critiques.

    a. Emphasize application of knowledge and skills acquired in Lesson No. 1.

Completion Standard

The lesson will have been successfully completed when the pilot can recognize the situation presented as one inviting poor judgment and applies the appropriate techniques as presented in Lesson No. 1.

APPENDIX B

TEACHING OUTLINE

The Flight and Critical, In-Flight events listed here are specific to the test project and will need to be changed for use in the Air Force simulator).

NAME _____

Indicate the lesson, flight plan and critical events below

LESSON: (Circle one of the following)

1 2 3 4 5

****

FLIGHT PLAN (Circle the appropriate number to the left of the plan used)

1. Plan a Visual Flight Rules (VFR) cross-country; Seaport Beach (SEA) to Gain County.

2. Plan a NIGHT VFR cross-country; Green Airpark to Waycross County.

3. Plan VFR cross-country; Gain County to Newton to Green Airpark.

4. Plan VFR cross-country; SEA to Zang to Moyer Memorial.

5. Plan VFR cross-country; SEA to Newton to Green Airpark.

****

CRITICAL IN-FLIGHT EVENT (Circle the letter to the left of each event used)

A. Upon opening flight plan, student is told destination airport is closed because of an accident.

B. Severe turbulence.

C. Drop in oil pressure; no change in oil temperature.

D. Departure field goes Instrument Meteorological Conditions (IMC).

E. Suction failure; Attitude Indicator (AI) and Heading Indicator (HI).

F. Loss of navigation station signal.

G. Loss of two-way radio communication.

H. Pilot Static system failure.

I. Partial loss of engine power.

J. Radar vectors for spacing and radar contact lost before intercept vector given.

K. Low fuel situation.

L. Vector into restricted area.

M. Pilot informed of a 30-minute delay for landing upon arrival at destination.

N. Upon arrival at destination, pilot is told Pilot Controlled Lighting (PCL) lighting inoperative.

O. Vectors opposite the desired direction of flight.

P. Cleared to take off immediately behind a B-727.

Q. Told Flight Service Station (FSS) does not find copy of Federal Aviation Administration (FAA) flight plan.

R. Student told to increase speed to arrive at destination 15 minutes early (low fuel state).

S. Student told that scattered cloud deck is at cruising altitude (reported ceiling is 3,000 feet higher).

T. Student informed of smoke or burning odor in the cockpit.

****

Indicate Hazardous Attitudes Observed: ....Invulnerability; ....Macho;

APPENDIX C

Training Manual

This Appendix is a Training Manual derived from a number of efforts, all of which grew out of the FAA report, Pilot Judgment Training and Evaluation, Volumes I - II! (DOT/FAA/CT-82-56), Embry-Riddle Aeronautical University, June 1982. Among these efforts was material provided as a result of research conducted at the Ohio State University by Dr. R. S. Jensen and Dr. J. Adrion. Their information proved invaluable and represents the heart of the manual. Additionally, the chapter on stress was taken from a "Judgment Training Manual for Australian Pilots," developed by Dr. Adrian Ashman as part of a project funded by the Australian Department of Aviation and conducted at the University of Newcastle.

Numerous other individuals and organizations provided vital contributions. Among these were Capt Steve Fessler and Capt Mark Fantasia, both of the US Air Force, Dr. W. Nelson, AFHRL; the General Aviation Manufacturers Association (GAMA); and the Canadian Air Transportation Administration.

Chapter 1

PILOT DECISIONAL ATTRIBUTE QUESTIONNAIRE (PDAQ)

Over the years each of us develops strategies to deal with life and the people around us to best accomplish our goals. Some of these strategies become deeply ingrained in us and we call them personality traits. These traits are fairly well established by the time we are 6 years old and are very difficult to change thereafter. Other strategies that are less deeply ingrained are called attitudes and can be changed quite easily, especially under pressure from several sources at the same time. We are constantly bombarded with attempts to change our attitudes by teachers, theologians, all forms of advertising, parents, peers, and superiors. Attitudes also form the basis for various attributes that are known to affect pilot decision making.

The following questionnaire is designed to assist you in determining your attributes as a pilot decision maker. Please answer all of the questions as honestly as you can. Your honest responses to these questions will greatly improve your performance in the remainder of this unit of instruction. There are no right or wrong answers and you will not show the results to anyone. The questionnaire is offered for the sole purpose of helping you to determine your decisional attributes as an Air Force pilot. Following the questionnaire, you will be shown how to score and interpret the results. The remainder of the manual is a guide to assist you in your AERONAUTICAL DECISION MAKING.

Instructions

1. Read each of the situations and five alternatives. As you read, try to place yourself in an airplane under the given circumstances.

2. Choose your most likely thought pattern in response to the situation and place a "1" in the space provided next to that alternative.

3. Continue by placing a "2" beside your next most probable thought pattern and then "3," "4," "5," in order of your next to least likely thought patterns.

4. Complete all 10 situations and be certain to fill in every blank.

Remember - This questionnaire has no correct answers and is intended for your information only. Some (or all) of the alternatives given may not represent the way you would think at all. However, for this questionnaire you should assign a rank to all of them.

Situation 1

Nearing the end of a long flight, your destination airport is reporting 800 and 1/2, fog and haze. You have just heard another aircraft miss the approach (Instrument Landing System (ILS) minimums are 200 and 1/2). You decide to attempt the ILS approach. Why did you make this attempt?

_____a. Ceiling and visibility estimates are often not accurate.

_____b. You are a better pilot than the one who just missed the approach.

_____c. You might as well try; you can't change the weather.

_____d. You are tired and just want to land now.

_____e. You've always been able to complete approaches under these circumstances.

Situation 2

You are scheduled to ferry an aircraft with no deicing equipment through an area in which "light to moderate rime or mixed icing in clouds, and precipitation above the freezing level," have been forecast. You decide to make the trip thinking...

_____a. You believe that you can adjust your altitudes enroute to avoid ice accumulation.

_____b. You've been in this situation lots of times and nothing has ever happened to you.

_____c. You must get home in 2 hours and can't wait.

_____d. You do not let an icing forecast stop you; they're usually overly cautious anyway.

_____e. There's nothing you can do about atmospheric conditions anyway.

Situation 3

You get to the airport for a scheduled cross-country flight. A fellow pilot whose girlfriend lives at your destination is scheduled as your co-pilot. The airplane you had scheduled has been grounded for avionics repairs. You are offered an airplane as a substitute that has a Horizontal Situation Indicator (HSI) and radios which you have never used. You take off on your flight with no additional briefing on the equipment unfamiliar to you. Why?

_____a. If the equipment is so difficult to operate, you would not have been "offered" the plane as a substitute.

_____b. You are in a hurry to make the scheduled arrival.

_____c. Equipment check-outs often are not needed.

_____d. You do not want to admit to your co-pilot that you are not familiar with the equipment.

_____e. You probably won't need to use that fancy equipment anyway.

Situation 4

You arrive at your destination airport on a Quick-Turnaround, Cross-Country Flight. Your prior calculation before departing indicated that you should have enough fuel to complete the trip with the required reserve. However, the winds on the trip over were greater than anticipated and you are not sure of the exact fuel burn in your aircraft. You decide to head for home without refueling because:

_____a. You can't waste time staying overnight because you and your co-pilot have to be at work in the morning.

_____b. The required fuel reserves are overly conservative.

_____c. The wind will probably die down for the return trip.

_____d. You don't want to admit to your lack of planning in front of anyone else.

_____e. It's not your fault the airport services are usually so slow; you will just have to try to make it home.

Situation 5

You have been cleared for the approach on an instrument flight rules (IFR) practice flight with a safety pilot on board. At the outer marker, Air Traffic Control (ATC) informs you of a low-level wind shear alert reported for your intended runway. Why do you continue the approach?

_____a. You just have to show the safety pilot that you can make this approach in spite of the wind.

_____b. It has been a perfect approach so far; nothing is likely to go wrong.

_____c. Those alerts are for other, less experienced pilots.

_____d. You need two more approaches to be current and want to get this one completed.

_____e. The tower cleared you for the approach; so, it must be okay.

Situation 6

You are about to fly the T-37 on a cross-country flight. During taxi, you notice a vibration. You go ahead and take off without checking further. Why?

_____a. You have to be at your destination by 5:00 p.m. and you're running late already; you can have it checked there.

_____b. You've noticed that vibration before and nothing has ever come of it.

_____c. You don't want your co-pilot to think you can't handle the aircraft; so, you just disregard the vibration.

_____d. Requirements for two perfectly smooth-running engines are overly conservative.

_____e. Maintenance just checked this plane yesterday; they would have caught any real problem.

Situation 7

You are enroute in instrument meteorological conditions and are receiving conflicting information from your two navigation receivers. You continue on your route of flight and shortly discover that the radios are so bad that you cannot get a definite fix on your location. You figure ATC will soon suggest that you are off course and ask you to correct it. You are thinking...

_____a. Try to figure out where you are so ATC won't find out first that you didn't know.

_____b. You will continue to navigate on your newer, more expensive receiver; the manufacturer must have made sure that it works.

_____c. You will get yourself out of this jam; you always do.

_____d. If ATC calls, you can be noncommittal; if they knew all, they would only make things worse.

_____e. Quickly tell ATC that you are lost and wait impatiently for their response.

Situation 8

As you turn final on an IFR approach, ATC calls and asks you how much fuel is on board. You know that you only have 2 minutes until you reach the approach point, and wonder why they have inquired as to your fuel status. You are also aware of severe thunderstorm activity nearby, but there are no such problems where you are presently flying. You assume you may be told to "hold" and think...

_____a. Your fuel is fine but you want to get down quickly, before the storm hits!

_____b. You are in line with the runway now and believe that you can land, even in any crosswind that might come up.

_____c. You will have to do this approach; the weather probably won't get any better.

_____d. You are not going to let ATC have you holding in possibly sever weather; it's not their neck.

_____e. The pilot who landed before me did okay; what could possibly happen?

Situation 9

You are on an IFR flight of only 50 miles. Your airplane develops a malfunctioning turn coordinator. You are a relatively low-time instrument pilot. The visibility is continually worsening and nearing approach minimums at your destination. You make this trip thinking...

_____a. You've never had a need to use the turn coordinator.

_____b. You have passed your instrument flight test and believe that you can handle this weather.

_____c. Why worry about it; ATC will get you out anyway.

_____d. You had better keep going before things get worse and you have to turn around.

_____e. Backup systems are not needed for such a short trip.

Situation 10

You are established on cruise above 10,000 feet. You notice you forgot to disconnect the "gold key," and do not do it now. What?

_____a. Disconnecting it at this point might look like you are afraid; you don't want to alarm your co-pilot.

_____b. Regulations are unnecessary for enroute operations.

_____c. You haven't been hurt yet by leaving it connected.

_____d. What's the use; if it's your time, it's just your time.

_____e. You've got to get the airplane under control; there's no time to do it.

PDAQ PROFILE

Scoring Key
(Remove this page from manual)

Scoring Instructions

From your PDAQ answers, write in the table below your rank for each alternative shown. Sum the ranking scores for each scale and enter at the bottom. These totals should then be marked on the PDAQ profile on the next page.

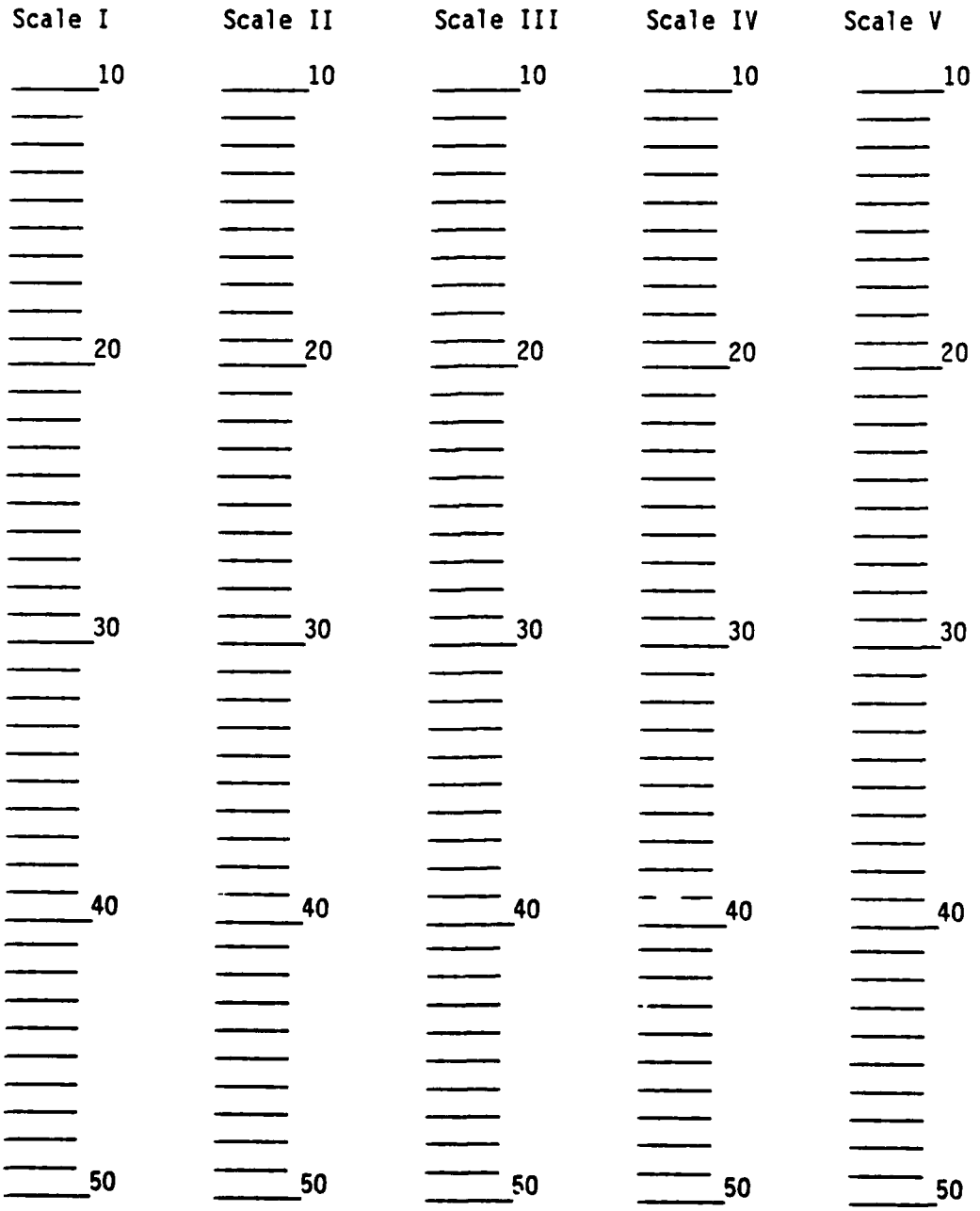
Situation	Scale I	Scale II	Scale III	Scale IV	Scale V	Total
1	a_____	d_____	e_____	b_____	c_____	15
2	d_____	c_____	b_____	a_____	e_____	15
3	c_____	b_____	e_____	d_____	a_____	15
4	b_____	a_____	c_____	d_____	e_____	15
5	c_____	d_____	b_____	a_____	e_____	15
6	d_____	a_____	b_____	c_____	e_____	15
7	d_____	e_____	c_____	a_____	b_____	15
8	d_____	a_____	e_____	b_____	c_____	15
9	e_____	d_____	a_____	b_____	c_____	15
10	b_____	e_____	c_____	a_____	d_____	15
Total	_____	_____	_____	_____	_____	150

The sum of your scores across must be 15 for each situation. If it is not, go back and make sure that you transferred the scores correctly and check your addition. The grand total should be 150.

PDAQ PROFILE

Total Raw Scores (from Scoring Key):

Place an "X" below at the point that corresponds to your total score for each scale. You have completed your Pilot Decisional Attribute Profile. Chapter 2 will explain the scales and their significance to your decision making as an Air Force pilot.



Chapter 2

INTRODUCTION TO AERONAUTICAL DECISION MAKING

There are two types of pilot judgments and both play a part in many accidents. The first, called perceptual judgment, refers to the sensation, perception and decision-making processes involved in fairly simple situations requiring rapid control movements. Examples are distance, clearance, speed, closure rate, and altitude judgments.

Perceptual judgments are highly influenced by expectancies. If one expects to see something a certain way and he/she does see something close to what he/she expects, but not the same, he/she will probably report and act as though he/she saw what he/she expected. Therefore, his/her actions or inactions in the perceptual area would be based on a false assumption. Although perceptual judgment is important to aviation safety, it receives a great deal of attention in conventional flight training and is not considered further in this manual.

The second type of pilot judgment is cognitive judgment. Cognitive judgment, the topic of this manual, refers to the thinking process that the pilot goes through in making a decision involving probabilistic information and several alternatives. It includes both the ability to think clearly, thoroughly, and quickly and the motivation to decide using criteria set by societal norms. In multiperson flight crews, good judgment also includes the effective use of the other members of the crew in the decision process.

One can make a long list of a pilot's failures in cognitive judgment, some of which might cause failures in perceptual judgment. These include:

1. Failure to use a checklist.
2. Failure to use a standard approach procedure.
3. Failure to lower flaps.
4. Failure to maintain required airspeed for no-flap approach.
5. Failure to set reference speed bug accurately.
6. Demonstration of touch-and-go landings of various types with minimal experience in aircraft.
7. Failure to properly assess the attention requirements for control of high-performance aircraft in traffic pattern.

Now the question becomes: What might cause these failures in cognitive judgment? The reasons go beyond experience, and beyond training and testing as they are conducted today.

Background

From the beginning of aviation history, pilots have been expected to exercise a considerable amount of judgment in the overall task of flying an airplane. The Wright brothers owe a great deal of their success to the fact that they exercised good aeronautical judgment at a time when many of their colleagues were killing themselves by considering flight to be nothing more than a thrill or adventure. They (a) knew and (b) respected the risks involved. These are the two keys to good aeronautical decision making. Both of these ideas will be presented to you in several different ways throughout this manual.

In recent years, increasing demands in our society for safety, dependability, economy, effectiveness, and reduced energy consumption have increased the complexity of flying operations, magnifying the pressures for good pilot judgment. Furthermore, technological advances that have eased much of the pilot's burden for precise aircraft control have not greatly eased the pilot's decision-making workload. In fact, these advances have changed the role of the pilot from one of controller to one of manager and decision maker. This new emphasis has created new demands for cockpit management and decision making.

If it were merely a matter of learning flying skills, pilot training would be a trivial task for most people. Unfortunately, because actual flying conditions are never quite the same as those used to develop aviation regulations, procedures, and performance limitations, the safety of each flight also depends upon a significant amount of evaluation and interpretation of existing conditions by the pilot.

For example, the conditions used to develop flight performance values for a particular type of airplane are usually ideal, including clean airplane surfaces, a new engine, and a company test pilot. Under actual operational conditions, the pilot must compare the book values obtained in ideal test conditions with those in which he/she finds himself/herself. The actual conditions may include a dirty airplane, a slightly used engine, and a less-than-perfect pilot. He/she must then evaluate many other conditions such as gross weight, center of gravity, wind, temperature, humidity, altitude, etc for comparison with those found in the book to determine his/her expected flight performance. Finally, he/she must check the present and forecast weather, the terrain, and expected traffic density and compare them with an estimate of his/her own capability before determining whether or not his/her planned flight will be safe. Examples such as these requiring decisions with less-than-perfect information can be found in all areas of flight activity.

Furthermore, every decision that the pilot makes is colored by physiological, psychological, and social pressures that are very difficult to weigh properly on the spot. For example, just as persons watching a sporting event may "see" an infraction or foul differently depending upon their vantage points and which team they support, a pilot may be influenced to view the weather outlook or his/her own abilities differently depending upon the importance he/she assigns to a given flight. Some pilots may be susceptible to social pressures that result in less-than-perfect judgment. Potential sources of social pressure include peer reaction, fear of failure, and censure from superiors.

The Pilot Judgment Problem. An analysis of accident statistics by categories of pilot behavior activities reveals the serious nature of the judgment problem. Most analyses of aviation accident statistics have found that 80% to 85% can be assigned broadly to "pilot error" and the remainder to mechanical malfunctions. To determine why pilots are making accident-causing errors, it is useful to classify pilot activities into three categories as follows:

1. Procedural Activities - the management of the powerplant, fuel, vehicle configuration, autopilot, displays, navigation, and communication.

2. Perceptual-Motor Activities - vehicle control; judgment of distance, speed, altitude, and clearance; hazard detection; and geographic orientation.

3. Decisional Activities - including the self-assessment of skill, knowledge, physical, and psychological capabilities; the assessment of aircraft and ground system capabilities; hazard assessment; navigation planning; and flight priority adjustment.

To determine the relative importance of each of these activities in Civil Aviation accidents, statistics from the National Transportation Safety Board Automated Aircraft Accident and Incident Information System from 1970 through 1974 were classified into the three behavioral categories given above. Then the total number of both fatal and non-fatal accidents during the 5-year period were determined for each of these behavioral categories. The results of these analyses are shown below.

	FATAL	NON-FATAL
Procedural	264 (4.6%)	2,230 (8.6%)
Perceptual-Motor	2,496 (43.8%)	14,561 (56.3%)
Decisional	2,940 (51.6%)	9,087 (35.1%)

Examination of these data provides valuable indications of possible weaknesses in current programs and reveals an important distinction. A majority of the non-fatal pilot-caused accidents (56.3%) were the result of faulty perceptual-motor behavior. The most significant factors here ("failure to maintain flying speed" and "misjudgment of distance, speed, altitude, or clearance") are called perceptual judgment. These are highly learned perceptions and control movements that must be made quickly, in some cases continuously.

On the other hand, a majority of the fatal pilot-caused accidents (51.6%) were the results of faulty decisional behavior, called cognitive judgment. The most significant factors in this area are "continued VFR into known adverse weather" and "inadequate preflight planning or preparation." Cognitive judgment describes the decisional activities involved in choosing a course of action from among several alternatives. Obviously, cognitive judgment is similar to perceptual judgment in that both involve making choices. However, there is a basic difference. The second refers to decisions for which set procedures have not always been established or may have been forgotten.

Flight instructors use various terms to refer to this cognitive judgment, such as "headwork," "thinking ahead," and "staying ahead of the aircraft." In a more general sense, pilots sometimes refer to it as "professionalism" or "commandability." Usually, more time is available to evaluate the situation, a large number of possible courses of action must be considered, and there is a greater degree of flexibility concerning the existing situation and possible outcomes. For these reasons, cognitive judgment has been a source of misunderstanding in pilot training and evaluation. The remainder of this manual deals with cognitive judgment.

Pilot judgment refers to a process that the pilot goes through in formulating a decision. As shown in Figure 1 on Page 7, there are various ways in which this intellectual process can be influenced through training. Going from the judgment process to the decision involves many other situational factors that may influence the final decision as well. These factors affect the decision from the standpoint of pilot motivation.

As indicated above, there is an important distinction that must be made between knowledge and motivation in aeronautical decision making. This distinction is shown in the following definition:

Aeronautical Decision Making is:

1. The ability to search for and establish the relevance of all available information regarding a flying situation, to specify alternative courses of action, and to determine expected outcomes from each alterative.

2. The motivation to choose and authoritatively execute a suitable cause of action within the timeframe permitted by the situation:

where:

a. "Suitable" is an alternative consistent with societal norms.

b. "Action" includes no action, some action, or action to seek more information.

The first part of the definition refers to intellectual abilities. It depends upon the pilot's capabilities to sense, store, retrieve, and integrate information. It is purely rational and could be stated mathematically. If it were possible to separate this part of human judgment from the second part (which it is not), humans would solve problems in much the same way as a computer. This is not to say that the decisions would be error-free. Probabilistic information is used, and performance is dependent upon the amount, type, and accuracy of information stored, as well as inherent and learned capabilities to process information.

The second part of the definition is where the decision takes place and indicates that the decision can be affected by motivations and attitudes. It says that a part of pilot judgment is based upon tendencies to use less than purely safety information in choosing courses of action. There is a tendency in all pilots to consider non-safety factors, such as job demands, convenience, monetary gain, self-esteem, adventure, commitment, etc. before taking action. However, if properly developed, this part of pilot judgment would tend to reduce the use of information not directly related to the safety of the flight and to direct the pilot's decision toward the use of more rational processes.

Pilot Responsibility

When the Air Force designates a pilot, it is granting that pilot the privilege to use public airspace and air navigation facilities. In accepting this privilege, the pilot is expected to adhere to the rules, without engaging in any activities that might infringe on the rights and safety of others. At all times, it is the pilot's responsibility to operate an aircraft safely, legally, and carefully.

The pilot in command always has direct responsibility for the operation of his/her aircraft, a responsibility not shared with anyone else--not with controllers, passengers, or flight instructors. Awesome as these responsibilities are, they are not spelled out in detail in any official document. When designated, a pilot is expected to use his/her "good judgment" to understand and interpret the rules in individual situations and in the most responsible manner.

The rules are not designed to guarantee your safety as a pilot even if you follow them to the letter. They are made to permit you, the pilot, who has acquired the best possible skill at a given level, to operate your aircraft with as much freedom as safety will allow. "Minimums" are provided for approaches as well as for maneuvers in specific airplanes. The assumption in establishing these minimums is that the pilot is properly qualified to fly the maneuver.

To illustrate, and to demonstrate that judgment is needed in air carrier operations as well, the FAA permits a fully loaded 727 to land on Runway 36 at National Airport with a 10-knot tailwind. This maneuver is possible with perfect pilot techniques. However, the air carriers do not take advantage of this privilege except under the most ideal circumstances with the best pilots. This is pilot judgment on the part of the air carriers. Anyone who may be less than a perfect pilot should not exercise the full privileges offered by FAA regulations. This places a heavy responsibility on the pilot to determine how far from the perfect pilot he/she is and to set his/her margin for error accordingly. We can see, then, why the exercise of good judgment is so crucial to flying safely.

Relationship of Judgment to Training

Two types of judgment training are needed. The first is intellectual. It must show the cues to look for to recognize a deteriorating situation such as "getting behind" the aircraft close to the ground. It should teach the need for standard approach patterns and the consequences of not following them. It should drill on the use of a checklist in single-pilot high-performance aircraft in particular and show why a checklist is important in all types of aircraft. This training should emphasize the need for placing one's complete attention on the airplane in terminal and pattern operations and ways to ensure that this is done.

The second judgment training area is motivational and considers the need for strict pilot discipline. This type of judgment training should be aimed at motivating the pilot to be cautious and safety-conscious. All flying is in part driven by the "background problem," which includes factors such as financial gain, ego building, flight-time building, social and peer pressure, adventure, and pressures from superiors or job duty. In motivational judgment training, the pilot must be taught to recognize the forces behind these background issues and to subordinate these when they begin to cause one to take unnecessary risks.

Strict discipline and attention to aircraft control can be learned over time but are far more effectively learned through deliberate judgment training. Students who have never seen their instructors compromise the checklist or traffic pattern will not so easily do so themselves.

Furthermore, to be effective, such training must demonstrate the consequences of not following such procedures. It should show what can happen when an abnormal traffic pattern is used and how difficult it is to recover from such a pattern. It should demonstrate the effect of slow-speed flight near the ground with no flaps. It should include discipline in this area. Each of these ideas could be taught in a flight simulator or an interactive computer simulating the particular aircraft dynamics. Many of these ideas could also be taught in a ground school. The days of luck and experience as effective teachers of these concepts are gone. We must use more modern techniques that are tailored to the more complex, less forgiving aircraft that we fly.

"Pilot Error"

The use of the term "pilot error" to describe an accident cause is an oversimplification that implies that the pilot intended to do what he/she did, causing the accident. Pilots intend to fly safely. Nevertheless, they do make decisional errors. Usually, their skill or luck is sufficient to get them out of situations resulting from poor judgment (a term for the general concept of decisional errors). The goal of this manual is to teach you, the Air Force pilot, techniques to avoid situations that require luck or skill greater than you may possess. Good judgment means avoiding situations that require superior skill to overcome.

Attitudes in Aeronautical Decision Making

In aviation we begin to develop attitudes about flying when we first think about flying. These attitudes develop as we discuss flying with other pilots. They are reinforced or changed by our flight instructors and our flying experiences. Sometimes attitudes developed in other areas of our lives carry over to influence our flying attitudes. These influences can be very healthy and assist us in our approach to flying. Other attitudes may be counter to safe flight. Attitudes are important in aviation because they influence our decision making.

How a pilot handles his/her responsibilities as "pilot-in-command" depends to a large degree upon ingrained attitudes--toward safety, toward him/her, and toward flying. Attitudes are learned; we are not born with them. Good attitudes can be developed--again, through training--into a positive mental framework that encourages and produces good pilot judgment. On the other hand, bad habits created by previously learned poor attitudes can be changed through training into good attitudes. How you can develop positive attitudes toward flying is the primary subject of this judgment training program.

Five Hazardous Attitudes. Certain attitudes or hazardous thought patterns in pilots are often associated with aviation accidents, when such attitudes or thoughts are present in the extreme. The following is a list of five of these hazardous attitudes:

1. "Anti-authority" - This attitude is found in pilots who resent any external control over their actions. It is a tendency to disregard rules and procedures.

2. "Impulsivity" - This attitude is found in pilots who act quickly, usually in the manner that first comes to mind.

3. "Invulnerability" - This attitude is found in pilots who act as though nothing bad can happen to them.

4. "Macho" - This attitude is found in pilots who continually try to prove themselves better than others. It is a tendency for pilots to act overconfident and attempt difficult tasks for the admiration it gains them.

5. "Resignation" - This attitude is found in pilots who feel that they have little or no control over their circumstances. They are resigned to let things be as they are. They may deny that the situation is as it appears. They are likely to fail to take charge of the situation. They may also let other people or commitments influence their decision making.

Interpreting Your Pilot Decisional Attribute Questionnaire

The following table summarizes the concepts discussed above and shows you how your decisional attributes discovered in Chapter 1 fit in. You should refer to your profile in Chapter 1. The peaks in the curve indicate possible hazardous attributes in your decision making that should receive attention. The next chapter will show you how to deal with these attributes.

Profile	High Scale	Attribute	Explanation
	I	Anti-Authority	"The Regs are for someone else."
	II	Impulsivity	"I must act now - there's no time."
	III	Invulnerability	"It won't happen to me."
	IV	Macho	"I'll show you---I can do it."
	V	Resignation	"What's the use?" It's not as bad as they say." "They're counting on me."

The Poor Judgment Chain

Accident data suggest that most mishaps result from a series of poor pilot decisions which may be called the "poor judgment chain." One erroneous decision increases the probability of another and as the poor judgment (PJ) chain grows, the probability of a safe flight deceases. Therefore, the student is instructed that the chain must be broken as soon as possible, beginning with the pilot's recognition that a poor judgment has been made. Consider the following example:

A noninstrument-rated pilot, with limited experience flying in adverse weather, wanted to arrive at his destination by a certain time, and he was already 30 minutes late. In spite of his weather inexperience, he decided to fly through an area of possible thunderstorms to reach this area just before dark. Arriving in the thunderstorm area, he encountered lightning, turbulence, and heavy clouds. Night was approaching, and the thick cloud cover made it very dark. In the darkness and turbulence, the pilot became spatially disoriented because he failed to trust his instruments.

This pilot made several errors in judgment. First, he let his desire to arrive at his destination on time override his concern for a safe flight. Then he overestimated his flying abilities and decided to use a route that took him through a potential area of thunderstorm activity. Next, the pilot passed on into obviously deteriorating conditions instead of changing course or landing prior to his destination.

The disastrous results, however, need not have been a foregone conclusion. The pilot could have broken the PJ chain at any time, but he did not. Good judgment would have meant flying around the adverse weather and accepting the

fact that he might be late. Once in the bad weather, good judgment could have led the pilot to decide to avoid flying into clouds and turbulence. Finally, before becoming disoriented in the dark, the pilot could have used good judgment to calm himself and rely on his instruments.

Two Principles of the PJ Chain

The first principle of the PJ chain is that one poor judgment increases the probability that another will follow. Decisions are based on information that the pilot has about him/herself, the aircraft, and the environment. He/she is less likely to make a poor decision if this information is accurate. Thus, one poor decision increases the availability of false information, which may then negatively influence decisions that follow.

The second principle of the PJ chain is that as the PJ chain grows, the alternatives for safe flight decrease. If a pilot selects a bad alternative, the options available to select better alternatives may be lost. For example, if a pilot makes a poor decision and flies into hazardous weather, the alternative to circumnavigate the weather is probably lost.

Breaking the PJ Chain

Because pilot judgment is a mental process, pilots can be trained--or even retrained, if necessary--to use good judgment in the first place or to reduce the influence of the hazardous decisional attributes mentioned above. Breaking a PJ chain in itself is an act of good pilot judgment. There are five steps that you can use to do so. (Note: While reading the following explanations for each step, refer to Figure 1 to understand better how the five steps work together to break a poor judgment chain.)

1. Recognize PF. Get feedback. Recognize that you may have made a poor decision and admit your error. If error recognition does not occur, your ability to prevent another poor decision is reduced. To recognize a poor decision, you must receive feedback.

Feedback is received from two sources: your senses (which give you an awareness of the situation) or an observer. In training, your best feedback comes from an outside observer, such as your flight instructor. Then, as training progresses, you learn to provide your own feedback. This is sometimes difficult because many people are hesitant to admit an error in judgment. Yet, as indicated above, safe flight requires these types of decisions.

2. Check for Stress. A high degree of stress and anxiety can reduce a pilot's ability to exercise good judgment. Later we will show you how to recognize your own stress and anxiety levels and reduce them.

3. Engage in Problem Resolving. Problem resolving is the necessary activity of correcting all hazardous situations that have resulted from the poor judgment. You will be learning more about pilot problem-resolving activities later in this manual.

4. Search for Other PJs. Remember that poor judgments tend to occur in chains. If one poor judgment is recognized, be absolutely certain that it is the only one currently affecting the operation of the aircraft.

5. Review Original PF, Give Self-Feedback. After a PJ chain has been broken, review the original poor decision, usually best done as soon as possible after landing. Critically examine what it was and how you came to make it. This review provides the feedback you need to avoid beginning a similar poor judgment chain in the future.

CHAPTER 3

IDENTIFICATION PRACTICE OF HAZARDOUS ATTITUDES

Better Decision Making Through Practice

This chapter is designed to help you identify and understand the five hazardous attitudes and to see how they can influence your reaction to situations requiring judgment. As you recall, the five hazardous attitudes are:

I	ANTI-AUTHORITY	"The Regs are for someone else."
II	IMPULSIVITY	"I must act now - there's no time."
III	INVULNERABILITY	"It won't happen to me."
IV	MACHO	"I'll show you. I can do it."
V	RESIGNATION	"What's the use?"
		"It's not as bad as they say."
		"They're counting on me."

Refer back to Chapter 2 and review the explanations of the hazardous attitudes. Once you have refreshed your memory with the definitions, continue with this exercise.

Below you will find another series of true flying situations. At the end of each situation, you will be asked to select an alternative which best illustrates the reactions of a pilot who has a particular hazardous attitude. After you select what you feel is the best alternative, look immediately at the appropriate response list for the proper response. This page will tell you if your answer is correct or incorrect. If you answered correctly, go on to the next situation. If you answered incorrectly, you will be told why. Then go back to the situation and select another alternative.

KEEP SELECTING ALTERNATIVES UNTIL YOU SELECT THE CORRECT ONE. Do not be concerned if you select a wrong alternative. You will learn something from the feedback given to you. The lessons are deliberately repetitious and thus get easier as you go along.

THE ANTI-AUTHORITY HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of an Anti-Authority hazardous attitude. Check your answers on the next page before continuing. REMEMBER--if you did not choose the correct answer, select another until you choose the correct one.

Situation 1

You approach the Very High Frequency Omni-directional Radio (VOR) and the controller asks if you intend to make a full VOR procedure or would accept a right turn of more than 90 degrees to the final approach course. You state that you will make the turn directly onto final at 2,000 feet though this will press you to get established on the approach. Which one of the following alternatives best illustrates the ANTI-AUTHORITY reaction?

a. It wasn't your idea to make the approach like this.

b. No controller is going to influence your flying.

c. You don't need the full approach; you know you are a good instrument pilot.

d. You are in a hurry and don't wish to bother with the full approach.

e. You know the controllers will be impressed with this approach.

A GOOD JUDGMENT THOUGHT ... "make as much time available on an approach as possible, you may need it."

Situation 2

You are advised of the current destination weather: "ceiling 400 feet, visibility 2 miles ...."The published minimum descent altitude is 400 feet above ground level. From your communications with radar, it is apparent you are experiencing some course problems due to a malfunctioning directional gyro and indeed you are. In spite of this, you elect to "make a pass at it." Which one of the following alternatives best illustrates the ANTI-AUTHORITY reaction?

a. You know you can make the approach; you've been in worse situations and have come through.

b. Minimums are quite conservative and you know you can dip down just enough to get in.

c. You don't like to fly with malfunctioning equipment and want to land immediately.

d. Wait 'til the guys hear this one!

e. It's not your fault the Directional Gyro (DG) isn't working; so, you might as well try it.

A GOOD JUDGMENT THOUGHT ... "Stay on the ground if you find yourself with an airplane inadequate for the task at hand--especially under instrument conditions."

RESPONSE LIST 1

THE ANTI-AUTHORITY HAZARDOUS ATTITUDE

Situation 1

Alternative a: By assuming someone else has responsibility for your approach, you exhibit a "What's the use?" attitude. Go back to Situation 1 and select another alternative.

Alternative b: Correct. "The Regs are for someone else" attitude assumes controllers are interfering with your business. You are thinking in an Anti-Authority manner. Go on to situation 2.

Alternative c: Here you are taking the "it won't happen to me" stand. You think of yourself as invulnerable. Go back to Situation 1 and select another alternative.

Alternative d: This is the hazardous thought of Impulsivity: "I must act now - there's no time." Go back to Situation 1 and select another alternative.

Alternative e: Whenever your wish to impress someone influences your decision, this is the Macho attitude; "I'll show you. I can do it." Go back to Situation 1 and select another alternative.

Situation 2

Alternative a: Invulnerability emphasizes "it won't happen to me." Go back to Situation 2 and select another alternative.

Alternative b: Absolutely! This is the Anti-Authority attitude, where the rules are for someone else. Go on the next section.

Alternative c: Decisions made in haste characterize the Impulsivity hazardous thought pattern, "I must act now - there's no time." Go back to Situation 2 and select another alternative.

Alternative d: No. This kind of thinking typifies the Macho attitude. Go back to Situation 2 and select another alternative.

Alternative e This kind of response suggests an attitude of Resignation--"What's the use?" You have no control over the events. Go back to Situation 2 and select another alternative.

THE IMPULSIVITY HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of an Impulsivity hazardous attitude. Check your answers on the next page before continuing. REMEMBER - if you did not choose the correct answer, select another until you choose the correct one.

Situation 1

At 10,000 feet, on an IFR flight above a thin layer, you became aware of a slight change in the "feel" of your engine. Three minutes later a small vibration began and you detected an odd, hot smell in the cockpit. Which one of the following alternatives best illustrates the IMPULSIVITY reaction?

a. Nothing will happen; the engine was just overhauled.

b. You figure there isn't anything you can do; it is the mechanics' fault.

c. You don't want to tell ATC; they might try to tell you what to do.

d. There are no flames yet and you can handle the situation.

e. You immediately chop the power, push the nose over and call ATC.

A GOOD JUDGMENT THOUGHT ... "Haste makes waste."

Situation 2

As you enter the pattern, you normally lower the flaps. The tower suddenly changes the active runway. Distracted, you forget to use the before-landing checklist. On short final, you find yourself dangerously low with a high sink rate. Glancing back, you realize that you forgot to extend the flaps. Which one of the following alternatives best illustrates the IMPULSIVITY reaction?

a. You feel that nothing is going to happen because you've made intentional no-flap landings before.

b. You laugh and think, "Boy, this low approach will impress people on the ground."

c. You think that using a checklist is a stupid requirement.

d. You immediately grab the flap handle and add full flaps.

e. You think, "It's all up to whether I get an updraft or downdraft now."

RESPONSE LIST 2

THE IMPULSIVITY HAZARDOUS ATTITUDE

Situation 1

Alternative a: No. This is the "It won't happen to me" attitude of being invulnerable. Go back to Situation 1 and select another alternative.

Alternative b: Putting the responsibility on someone else shows the attribute of Resignation. Go back to Situation 1 and select another alternative.

Alternative c: This is resenting the authority of someone else or thinking Anti-Authority hazardous thought pattern. Go back to Situation 1 and select another alternative.

Alternative d: No. This is showing the Macho attitude of "I can do it." Go back to Situation 1 and select another alternative.

Alternative e: Absolutely! "I must act now - there's no time" is the thought behind this alternative. Go on to Situation 2.

Situation 2

Alternative a: Feeling that nothing bad can happen suggests the Invulnerability hazardous thought pattern, "It won't happen to me." Go back to Situation 1 and select another alternative.

Alternative b: When you are thinking about impressing people on the ground, watch out for the Macho hazardous thought, "I can do it." Go back to Situation 1 and select another alterative.

Alternative c: Thinking that checklists are stupid suggests that you feel the aircraft designers, the Government, and your instructor --all of whom urge the use of checklists--are wrong. This suggests a "Don't tell me" reaction which is the Anti-Authority hazardous thought. Go back to Situation 1 and select another alternative.

Alternative d: Right! Immediately adding full flaps without thinking is an example of the Impulsivity hazardous thought, "Do something quickly." Unfortunately, in this situation, full flaps will probably only increase the sink rate. Go on to the next section.

Alternative e: If you are convinced that it's up to the wind, this implies the hazardous thought of Resignation, "What's the use." Go back to Situation 1 and select another alternative.

THE INVULNERABILITY HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of an Invulnerability hazardous attitude. Check your answers on the next page before continuing. REMEMBER--if you did not choose the correct answer, select another until you choose the correct one.

Situation 1

You are enroute to your destination which is in a Group I Terminal Control Area (TCA), actually only 5 miles inside the TCA. Your destination is reporting VFR; so, you elect to cancel your IFR flight plan and skirt in under the lower limit of the TCA and request a special VFR landing. Which one of the following alternatives best illustrates the INVULNERABILITY reaction?

a. There is really nothing ATC could do to help in this situation anyway.

b. You do this all the time; no problem.

c. TCAs are just another control device put on pilots.

d. This is the first idea that comes to mind; you go for it.

e. This is the way the good pilots do it.

A GOOD JUDGMENT THOUGHT ... "Accept all the help you can get."

Situation 2

You've made this approach at least 100 times, many times down to minimums. The early morning ground fog these summer mornings presents an even more challenging picture. As you reach the Minimum Descent Altitude (MDA), you peer through the muck, straining to see that familiar scene. Just as the "TO/FROM" indicator flips, you catch a glimpse of what you know must be the end of the runway. You go for it. Which one of the following alternatives best illustrates the INVULNERABILITY reaction?

a. You've made this approach so many times you could do it with your eyes shut.

b. You know the minimums can be fudged, just a bit.

c. There's really nothing to this; all's well that ends well.

d. Land it now; there's no time to waste.

e. You hope luck is with you now; it's out of your control.

A GOOD JUDGMENT THOUGHT ... "Make sure that the runway is in the eye of the beholder."

RESPONSE LIST 3

THE INVULNERABILITY HAZARDOUS ATTITUDE

Situation 1

Alternative a: This is an attitude of Resignation--"What's the use? Nobody can help me anyway." Go back to Situation 1 and select another alternative.

Alternative b: You're right! Invulnerability hazardous thoughts include "It won't happen to me." Go on to Situation 2.

Alternative c: No. "Regs are for someone else" is the Anti-Authority attitude. Go back to Situation 1 and select another alternative.

Alternative d: The need to "act now" is shown here. This is the Impulsivity hazardous thought pattern. Go back to Situation 1 and select another alternative.

Alternative e: Identifying with the thought "I'll show you" is the Macho attitude. Go back to Situation 1 and select another alternative.

Situation 2

Alternative a: No. This is the Macho attitude. Go back to Situation 2 and select another alternative.

Alternative b: Thinking "the Regs are for someone else" is the hazardous thought of Anti-Authority. Go back to Situation 2 and select another alternative.

Alternative c: Correct. "It won't happen to me" is the attitude of being invulnerable. Go on to the next hazardous attitude.

Alternative d: No. "I must act now - there's no time" is the hazardous attitude of Impulsivity. Go back to Situation 2 and select another alternative.

Alternative e: Figuring the situation is out of your control is thinking in the Resignation hazardous attitude mode. Go back to Situation 2 and select another alternative.

THE MACHO HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of a Macho hazardous attitude. Check your answers on the next page before continuing. REMEMBER--if you did not choose the correct answer, select another until you choose the correct one.

Situation 1

On a trip to the east coast, you stop at an enroute Air Force base for fuel. After refueling, the density altitude prior to your departure is reported as 10,500 feet. You are already slightly heavy when you depart. At the rate you are climbing, you will just barely clear the minimum crossing altitude at the next intersection on your route of flight. Which one of the following alternatives best illustrates the MACHO reaction?

a. There is really nothing you can do about it; it is up to ATC to make sure you clear.

b. The MCAs have plenty of leeway for clearance. So what if you're a little low.

c. Don't worry, you're a good pilot and will make it.

d. When you see that you cannot climb enough, you immediately inform ATC of your situation without determining your intentions.

e. Mountain flying isn't any different and you've never run into any problems before. Nothing will happen.

"A GOOD JUDGMENT THOUGHT ... "Understand and use your aircraft performance charts."

Situation 2

On an Instrument Flight Rules (IFR) flight plan, you emerge from a cloud to find yourself within 300 feet of a helicopter. Which one of the following alternatives best illustrates the MACHO reaction?

a. You're not too concerned; everything will be alright.

b. You should fly a little closer, just to show him....

c. It's not your responsibility to keep separated.

d. You quickly turn away and dive, to avoid a collision.

e. With events like this, why should you ever follow the rules?

A GOOD JUDGMENT THOUGHT..."Fly defensively."

RESPONSE LIST 4

THE MACHO HAZARDOUS ATTITUDE

Situation 1

Alternative a: Assuming someone else is responsible for you is the Resignation hazardous attitude. Go back to Situation 1 and select another alternative.

Alternative b: "The Regs are for someone else" and not necessarily for you is thinking in the Anti-Authority mode. Go back to Situation 1 and select another alternative.

Alternative c: Right! Thinking "I'll show you. I can do it" is the Macho hazardous attitude. Go on to Situation 2.

Alternative d: Acting before thinking is exercising the Impulsivity hazardous attitude. Go back to Situation 1 and select another alternative.

Alternative e: Saying nothing will happen to you is the Invulnerability hazardous attitude. Go back to Situation 1 and select another alternative.

Situation 2

Alternative a: No. This is the Invulnerability hazardous attitude that you have never had problems before and it will never happen to you. Go back to Situation 2 and select another alternative.

Alternative b: That's it. Macho hazardous thoughts include "I'll show you." Go on to the next hazardous attitude.

Alternative c: Taking for granted that you are not in control is the hazardous attitude of Resignation. Go back to Situation 2 and select another alternative.

Alternative d: This is acting on impulse, "I must act now, there's no time." Go back to Situation 2 and select another alternative.

Alternative e: An attitude that the rules do not have to be followed shows the Anti-Authority hazardous thought pattern. Go back to Situation 2 and select another alternative.

THE RESIGNATION HAZARDOUS ATTITUDE

From the five choices following each situation, pick the ONE choice that is the best example of a Resignation hazardous attitude. Check your answers on the next page before continuing. REMEMBER--if you did not choose the correct answer, select another until you choose the correct one.

Situation 1

You are pilot-in-command of an IFR flight in Instrument Meterological Conditions (IMC). You have just encountered embedded thunderstorms on your route of flight. Which one of the following alternatives best illustrates the RESIGNATION reaction?

a. What's a little storm? You always come through these situations.

b. Quick, turn around to get out of it.

c. Though your instructor taught you to slow down in turbulence, you're going to bore right through this as fast as possible. What did he know?

d. It's ATC's responsibility to keep you out of the weather.

e. You can handle this like a pro.

A GOOD JUDGMENT THOUGHT...."If caught in a storm, follow procedures."

Situation 2

You have just run your two wing fuel tanks dry. It is apparent that the fuel gauge is not indicating properly. You are in and out of clouds on your IFR flight plan at night. Which one of the following alternatives best illustrates the RESIGNATION reaction?

a. You can really show them now!

b. You can still make your destination; those reserve requirements are just formalities.

c. Well, that's the way things go.

d. You've been in tight spots before and everything always works out.

e. You must land now; there is no time.

A GOOD JUDGMENT THOUGHT...."Cross-check your fuel consumption."

RESPONSE LIST 5

THE RESIGNATION HAZARDOUS ATTITUDE

Situation 1

Alternative a: Assuming nothing will happen to you is the attitude of Invulnerability. Go back to Situation 1 and select another alternative.

Alternative b: No. This is acting on impulse. Go back to Situation 1 and select another alternative.

Alternative c: Going against an authority figure is the Anti-Authority attitude. Go back to Situation 1 and select another alternative.

Alternative d: Correct! This is the hazardous attitude of Resignation. The acceptance of the fact that the situation is not within control and you cannot change things typifies this attitude. Go on to Situation 2.

Alternative e: "I can do it" is the macho attitude. Go back to Situation 1 and select another alternative.

Situation 2

Alternative a: No. "I'll show them" is thinking in the Macho hazardous attitude pattern. Go back to Situation 2 and select another alternative.

Alternative b: "The Reg's are for someone else" is the hazardous attitude of Anti-Authority. Go back to Situation 2 and select another alternative.

Alternative c: Yes. This idea of not being able to control the situation is the hazardous attitude of Resignation. Go on to the next exercise.

Alternative d: The Invulnerability hazardous attitude involves not believing that it could happen to you. Go back to Situation 2 and select another alternative.

Alternative e: No. This is the attitude of Impulsivity. "I must act now-there's no time." Go back to Situation 2 and select another alternative.

CHAPTER 4

ANTIDOTES FOR HAZARDOUS THOUGHTS

After having completed the previous section carefully, you now should be able to identify the five major hazardous thoughts which contribute to poor pilot judgment. Moreover, by considering your own actions and reactions to difficult or stressful situations, you will be more aware of and alert to such patterns in your own thinking. This is an important first step in eliminating hazardous thoughts from your judgments. This chapter is designed to teach you a way to counteract hazardous thoughts so that they do not affect your actions.

Since you cannot think about two things at once, one way to keep from thinking a hazardous thought is to think another thought. By telling yourself something different from the hazardous thought, you are "taking an antidote" to counteract the hazardous thought. You remove a hazardous thought by substituting the antidote. Thus, if you discover yourself thinking, "It won't happen to me", mentally tell yourself, "That is a hazardous thought." Recognize a hazardous thought, and then say its antidote to yourself.

To do this, you must MEMORIZE THE ANTIDOTES for each of the hazardous thoughts. Learn them so well that they will automatically come to mind when you need them.

Hazardous Thought	Antidote
ANTI-AUTHORITY: "Don't tell me what to do!"	"Follow the rules. They are usually right."
IMPULSIVITY: "Do something - quickly!"	"Not so fast. Think first."
INVULNERABILITY "It won't happen to me."	"It could happen to me. Be careful."
MACHO "I can do it."	"Taking chances is foolish."
RESIGNATION: "What's the use?"	"I'm not helpless. I can make a difference."

ANTIDOTE RECALL

Do not proceed with this lesson until you have learned the antidotes thoroughly. Practice them now as you would a checklist. Without referring to the text, write the antidote to each hazardous thought. Check your statements with those above, and if you are correct, continue. If not, study the antidotes until you can write them word-for-word from memory.

ANTIDOTE IDENTIFICATION

Each of the following situations contains a description of what is happening in a flight situation and what the pilot is thinking. Correctly apply the hazardous thought antidotes.

Instructions

1. In Situation 1, review the thinking and actions of the pilot, then look for signs of hazardous thoughts. When you recognize one, write its name and its antidote.

2. After completing Situation 1, review the answers. Do not proceed with the other situations until you have done so. Your responses should closely match the hazardous thought responses identified in the key. (Note: Different people may see the same situation slightly differently; so, your answers may not be identical to the key. However, your answers should agree with the key for at least three of the hazardous thoughts, and you should have written, word-for-word, the correct antidote.)

3. If you do not do well on Situation 1, study your answers to discover what misunderstandings you have about the hazardous thoughts and their antidotes. If necessary, return to earlier chapters in this manual to clear up any confusion before going on to the next situation. This is very important. You will learn more from this exercise if you are clear about the material covered up to this point than if you simply read through the exercise without working carefully through it.

4. Continue with the remaining situations in the same manner. Follow the instructions at the end of the situation key to guide you to the completion of this section.

Situation 1

A relatively new 2Lt assigned as an instructor to Air Training Command has gained approval to take one of the Squadron's T-37 aircraft on a cross-country over the weekend. He plans the trip to a midwest Air Force base not far from his home town of about 1,000 people. In the air, the pilot thinks, "It's great to be up here without a student to worry about or another instructor criticizing everything I do. The do-it-by-the-book attitude of the Training Command takes all the fun out of flying."

As he approaches his destination, he decides to make a pass over his home town and land at the small municipal airport. He thinks, "It won't be dangerous at all...the airport is well maintained and everyone will get quite a charge out of it. I'll just extend the ETA on my VFR flight plan so I won't get in trouble and the Air Force will never know."

"If anyone should happen to check on me or find out I landed at an unauthorized airport, I'll just tell them it was a precautionary landing. O.K., I'll do it. The plan is foolproof."

The 2d Lt makes a hard landing and nearly runs off the runway before he gets the aircraft stopped. However, he is very proud of himself and he thinks, "Right on! You're a natural for being a great pilot."

As he taxies to the ramp area, a county sheriff's car drives up with the lights going. Surprised that a sheriff's deputy would pay any attention to his landing here, he starts cursing this unpleasant turn of events. "I just know this cop is going to foul up my whole day. Why don't they stick to catching real criminals and leave people like me alone to have some harmless fun? If it weren't for my bad luck, this cop wouldn't have come along and this would have been a great afternoon."

Do not proceed with Situation 2 until you have reviewed the answer key to this situation.

Situation 2

A student and instructor pilot (IP) are returning from a VFR dual cross-country, and they decide to "buzz" a group of sunbathers. The instructor is an experienced pilot and has related stories of doing this kind of thing many times before. In fact, he often brags that someday he will be a member of the "Thunderbirds," and then everybody will be able to see his talents on display.

The student obviously gets a charge out of it. However, as a low-time pilot, he wonders if they are not pushing their luck. He is not worried about an accident, however, because he is convinced that his instructor is a great pilot who can handle anything that might happen.

As they are "buzzing" the beach, both are interested in watching for the reactions of the sunbathers on the ground. They descend lower than usual on the third pass. When they try to climb out, the plane does not make it over the power transmission lines. They catch a line, sparks fly, and the wing sustains minor damage. The student yells, "We're going to crash, we're going to crash!"

The IP is shaken, but he maintains control of the airplane and tells his student, "Calm down and let's fly this thing back to the base, or we're going to be in big trouble over this. I told you I could handle anything in this airplane."

As they head for the base, the airplane continues to fly without difficulty. They have a good laugh over the incident, telling one another that it is another great adventure in their flying careers. The IP says "We'll report this as a bird strike and I think I can arrange things with maintenance so it stays that way. You know, if the power company had any sense, they would bury all those power lines. If they would do that, pilots like us would have an easier time of flying safely."

Do not proceed with Situation 3 until you have reviewed the answer key to this situation.

Situation 3

A 2d Lt is authorized a cross-country to a civilian airport with a part-time tower. His approval specified that he must arrive while the tower is in operation and the Airport Traffic Area is in effect. There is a Notice to Airmen (NOTAM) on the runway lights, but he is in a hurry and neglects to check.

As things would have it, he arrives late and is faced with a night landing and no runway lights. He thinks, "I didn't consider the possibility of arriving this late. I should have checked the NOTAM." Then he becomes angry with the airport management, thinking, "They could work out something with these lights, either leave them on at night, or install a pilot-controlled system. Who are they to control how late I land? I'll see the manager tomorrow and tell him a thing or two about how to run an airport."

Determined to land, he declares, "I'm landing here tonight, lights or no lights. I'll just have to rely on myself and show them how a top-notch Air Force pilot can do whatever needs doing." He chooses the runway which parallels the highway adjacent to the airport and uses the street lights as reference. Unsure of his height above the runway, he flares too quickly and begins to float. He immediately forces the airplane onto the runway rather than going around or extending his landing.

After landing hard, the aircraft swerves off the runway and into a fence. He is unhurt, but the airplane is substantially damaged. To himself, he says, "If the lights were on, this would not have happened."

A few minutes later some people arrive to see what has happened. He starts telling them how the accident is the fault of the airport management. Someone asks him why he decided to land without airport lights. "There should be more rules about how to run an airport and less about how to fly airplanes."

Check your answers to this section with the appropriate key.

RECOGNIZING AND REPLACING HAZARDOUS THOUGHTS

You have now learned the meaning of the five hazardous thoughts and the antidotes to substitute for them. But, for judgment training to benefit you, the mental process of recognizing a hazardous thought, substituting the correct antidote, and then supplying good judgment thoughts must become automatic.

The following exercise provides additional practice in recognizing potential hazardous thoughts in various flight situations, recalling the correct antidote, and thinking of good pilot judgment for the same situation. Answers are provided for the first three situations. You should be able to complete the rest.

Instructions

1. Read each situation and the description of the pilot's thinking.

2. In the blanks beneath each situation, fill in the hazardous thought and antidote, and a brief description of good pilot judgment for the same situation. (You do not need to write complete sentences.)

3. Ask your instructor to review your answers when you have completed the first five situations.

Situation 1

Pushing in the fuel quantity test switch fails to return the fuel quantity indicator needle to zero, indicating that the fuel gauging system is not operating properly. Everything else appears to be normal and so you elect to continue the takeoff! Your co-pilot feels strongly that you should discontinue the flight and return to base. You become upset and inform him that you have seen this kind of thing before and it always turns out to be a faulty instrument.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 2

You have been cleared for a night visual approach into an airport surrounded by a very confusing pattern of lights. You are not sure if this is the airport. Nothing looks familiar, but it has been over a year since you were last here. You decide not to say anything and to go ahead and land, thinking, "This has to be it, let's land and get this flight over with."

Hazardous Thought:

Antidote:

Good Judgment:

Situation 3

You are assigned to take a visiting VIP on a T-37 orientation flight. You neglect to ensure that he has the Parachute Arming Lanyard Anchor properly secured. Rather than pointing it out now, you go ahead and take off. You know that, as a good pilot, you could handle any emergency long enough to get him buckled up properly.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 4

Landing at an unfamiliar airport for fuel, you give instructions to the line crew and run inside the terminal to go to the washroom. Returning to the aircraft, you are in a hurry and do not check the position of the fuel filler cap. You feel that the responsibility for ensuring that the fuel filler caps are positioned properly is not yours anyway.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 5

You are assigned to a local night solo flight. After takeoff, you fly into a low-hanging cloud layer which you had not noticed before. You think that you will be out of the clouds soon because the sky looked clear from the ground. Besides, you have flown through light clouds before in the daylight.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 6

You are on a cross-country flight with three other T-37's and are scheduled for a night launch to return home. After a very light lunch, the other pilots, all of whom are having a beer, invite you to join them for an afternoon on the beach. They have a cooler of beer and food already packed. They remind you that you have flown the route many times and it appears that the weather conditions will remain excellent. They begin to mock you for not drinking with them. You decide to join them, thinking that just one beer will not have a bad effect on you.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 7

The tower advises you to land on a runway other than the one you prefer. You see other airplanes using the runway of your choice and wonder why you have been denied permission. Since the recommended runway is on the far side of the airport, you radio the tower and ask for a reconsideration. You feel that if other pilots can land their airplanes on the other runway, so can you.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 8

Because of strong headwinds on a cross-country flight, you land at an auxiliary airfield to refuel, only to learn they are out of fuel. The Operations Officer suggests that you backtrack 50 miles to an airfield that has fuel. You continue the flight because your own instructor approved your flight plan with knowledge of the weather conditions.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 9

The weather forecast calls for drizzling rain across the ranges. Enroute, you notice ice accumulating on the wings. You are not sure what to do because you have never encountered this problem before. Because the airplane is still flying well, you are tempted to do nothing. Your co-pilot suggests you might radio for information. You radio for information but decide to ignore the advice since the airplane is continuing to fly well and the ice buildup does not seem to getting worse.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 10

It is a bleak winter's morning. The temperature is below zero and you are not looking forward to the flight north. Visibility is just over 3 miles. It snowed earlier in the day. The ceiling is 1,100 feet. Earlier, the airplane was cleared of what remained of the slushy snow, but takeoff has been delayed for 15 minutes because of an advancing low cloud. Sleety conditions appear to be returning from the south, there are already flakes dropping on the screen, and you wonder if you will be able to take off. You feel there is no use getting the ice removed, it is only going to form again.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 11

On final approach at night, you fly into patches of ground fog which severely limits visibility. Your altitude is 150 feet, and you debate whether you can level off at the correct height and land properly or whether you should abort the approach. You feel that the situation presents a challenge and you give your mind completely over to making the landing.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 12

The weather briefer advises you of possible hazardous weather conditions at your destination. Enroute you encounter a brief thunderstorm and increasingly poor visibility. Although you have plenty of fuel to return to your departure point, you have a hunch that the weather will improve before you reach your destination. You think that the weather people are always complicating your flights, and sometimes, such as now, it is best to ignore them.

Hazardous Thought:

Antidote:

Good Judgment:

Situation 13

Ideally you would like to arrive early for an important date. If you stick to your flight plan, you will just make it, assuming there are no delays. Another alternative would be to take a route over the mountains, which will get you there much earlier. If you choose the latter, it means you might encounter a few low-hanging clouds near the peaks, while 300-degree weather prevails over the planned route. You tell yourself that there is no sense sticking to the planned route because, "There's nothing else to do to be sure to make it early."

Hazardous Thought:

Antidote:

Good Judgment:

Although you have had some practice at recognizing dangerous thought patterns, and applying the antidotes, this is not really the end of your learning about the five hazardous thoughts. When you were learning your checklists, you most likely practiced them when you had time. Treat the hazardous thoughts and the antidotes in the same way. Practice them so that they become familiar only by making them a part of you. Will you automatically apply them when the antidote is needed most?

Turn to the next section, or collect the Stress package from your instructor.

Answer Key to Situations

Situation 1

Hazardous Thought: "It's great to be up here without an instructor criticizing everything I do. His do-it-by-the-book attitude takes all the fun out of flying."

Antidote: Anti-authority - "Follow the rules. They are usually right."

Hazardous Thought: "I'll land at an unauthorized airport."

Antidote: Impulsivity - "Not so fast. Think first."

Hazardous Thought: "The plan is foolproof."

Antidote: Invulnerability - "It could happen to me."

Hazardous Thought: "Right on! You're a natural for being a great pilot."

Antidote: Macho - "Taking chances is foolish."

Hazardous Thought: "If it weren't for my bad luck, this cop wouldn't have come along, and this would have been a great afternoon."

Antidote: Resignation - I'm not helpless. I can make a difference.

Situation 2

Hazardous Thought: In fact, he often brags that someday he will be a member of the Thunderbirds and then everybody will be able to see his talents on display.

Antidote: Macho - "Taking chances is foolish."

Hazardous Thought: He is convinced that his IP is a great pilot who can handle anything that might happen.

Antidote: Invulnerability - "It could happen to me."

Hazardous Thought: The student panics and yells, "We're going to crash, we're going to crash!"

Antidote: Impulsivity - "Not so fast. Think first."

Hazardous Thought: "Calm down and let's fly this thing back to the base or we're going to be in big trouble over this. I told you I could handle anything in this airplane."

Antidote: Macho - "Taking chances is foolish."

Hazardous Thought: ...telling one another that it is another great adventure in their flying careers.

Antidote: Invulnerability - "It could happen to me."

Hazardous Thought: "If they would do that, pilots like us would have an easier time of flying safely."

Antidote: Resignation - "I'm not helpless. I can make a difference."

Situation 3

Hazardous Thought: "They could leave the lights on at night. Who are they to control how late I can land?"

Antidote: Anti-authority - "Follow the rules - they are usually right."

Hazardous Thought: "I'll just have to rely on myself and show them how a top-notch Air Force pilot can do whatever needs doing."

Antidote: Macho - "Taking chances is foolish."

Hazardous Thought: He immediately forces the airplane onto the runway rather than going around or extending his landing.

Antidote: Impulsivity - "Not so fast. Think first."

Hazardous Thought: To himself, Bill says, "If the lights were on, this would not have happened."

Antidote: Resignation - "I'm not helpless. I can make a difference."

Hazardous Thought: Bill starts telling them how the accident is the fault of the local airport management.

Antidote: Resignation - "I'm not helpless. I can make a difference."

Hazardous Thought: "Look, I'm an experienced pilot. Having no lights is not a serious problem."

Antidote: Macho - "Taking chances is foolish."

Hazardous Thought: "There should be more rules about how to run an airport and less about how to fly airplanes."

Antidote: Anti-authority - "Follow the rules. They are usually right."

CHAPTER 5

INFLUENCES AND RESOLUTION OF STRESS

Flying or not, one of the most fundamental issues when dealing with safety is how we deal with stress. Stress in its various forms has a large number of causes and consequences. In this section, we examine stress as it affects our lives in general and our flying performance in particular. Suggestions are then made to enable us to deal with stress more effectively.

Simply recognizing the involvement of stress does not necessarily solve our problems. We must try to understand stress and how to cope with it. The growing interest in stress reflects the widespread awareness that stress is related to many physical and mental disorders, and to a large number of home-and-work-related accidents.

DEFINING STRESS

Stress is the term we use to describe the body's nonspecific response to demands placed upon it, whether these demands are pleasant or unpleasant. This description is important because the body reacts in the same way to any change. The change can be physical or emotional, painful or pleasant, or even life-threatening. The change for you could be an unexpected windshear encountered on landing, recognizing low oil pressure during your preflight check, traveling on vacation, losing your wallet, or cutting your finger. Our bodies will respond to these and all other demands in three stages: First, there will be an alarm reaction; then resistance; and finally, exhaustion (if the stress continues). This three-stage response is part of our primitive biological coping mechanism, which would have prepared our ancestors for fight or flight.

Alarm Reaction. In the alarm stage, the body recognizes the stressor, and prepares for fight or flight by activating a part of the brain (called the hypothalamus) which stimulates the pituitary gland to release hormones. These hormones trigger the adrenal glands to pour out adrenalin. Adrenalin increases heartbeat and rate of breathing, raises blood sugar level, increases perspiration, dilates the pupils, and slows digestion. The process results in a huge burst of energy, greater muscular strength, and better hearing and vision. You may have experienced several alarm reactions during your flying; for example, a sudden buffeting on low final. You may recall the effects of your body's alarm reaction.

Resistance. In the resistance stage, the body repairs any damage caused by the stress and may adapt to some stresses such as extreme cold, hard physical labor, or worries. Fortunately, most physical and emotional stressors are of brief duration and our bodies cope with the physiological demands of the stress. During our lifetime we go through the first two stages many times. We need these response mechanisms to react to the many demands and threats of daily living.

However, if the stress continues (for example, if you were caught on a VFR flight in instrument conditions, or realize that you may not reach your destination because of a fuel shortage), the body will remain in a constant state of readiness for fight or flight. It will be unable to keep up with the demands. This state leads to the final stage of exhaustion.

Exhaustion. Exhaustion generally affects only specific parts of the body and is temporary. For instance, marathon runners experience in their muscles and cardiovascular system severe stress which leads to exhaustion, but after a good rest, they are back to normal and look forward to the next race. If exhaustion continues without relief over an extended period, there is risk of one of the diseases of stress (such as high blood pressure, arteriosclerosis, migraine headaches, gastrointestinal disorder, rheumatoid arthritis, or asthma). The body may even give up, resulting in death.

ALL STRESS IS NOT BAD

Life without stress would be pretty dull. In reasonable doses, stress adds excitement to life. It is impossible to live without experiencing some degree of stress. Even when we are asleep, our bodies are functioning, providing us with dreams which produce some stress.

Some situations can prompt bad stressors, causing damage or distress. Other types of stress are pleasurable, such as the exhilaration we experience as we accelerate down the runway on takeoff. Further, what may be stressful for one person may not be stressful for another.

THE EFFECTS OF STRESS

It is very easy to dismiss the effect of stress if we consider that it is having little impact upon our day-to-day functioning. However, the cumulative effect of persistent high levels of stress may lead to irritability, short temper, and low frustration tolerance in the short term. In the long term, continued stress may lead to changes in the nervous system and the body organs, including reduction of white cells and suppression of the immune system, creating conditions for disease.

Self-Observable Signs of Stress

1. General irritability, hyperexcitation, or depression.
2. Pounding of the heart, an indicator of high blood pressure.
3. Dryness of the throat and mouth.
4. Impulsive behavior, emotional instability.
5. The overpowering urge to cry or to run and hide.
6. Inability to concentrate, flight of thoughts, and general disorientation.

7. Feelings of unreality, weakness, or dizziness.

8. Predisposition to become fatigued, and loss of the sense of fun in life.

9. "Floating anxiety." (We are afraid although we do not know exactly what we are afraid of.)

10. Emotional tension and alertness, feeling of being "keyed up."

11. Trembling, nervous tics.

12. Tendency to be easily startled by small sounds.

13. High-pitched, nervous laughter.

14. Stuttering and other speech difficulties.

15. Grinding of the teeth.

16. Insomnia.

17. Hyperactivity. (A tendency to move about without any reason; an inability to just physically relax.)

18. Sweating.

19. The frequent need to urinate.

20. Diarrhea, indigestion, queasiness in the stomach, and sometimes vomiting.

21. Migraine headaches.

22. Premenstrual tension or missed menstrual cycles.

23. Pain in the neck or lower back.

24. Loss of or excessive appetite.

25. Increased smoking.

26. Increased use of legally prescribed drugs, such as tranquilizers or amphetamines.

27. Alcohol and drug addiction.

28. Nightmares.

29. Accident proneness.

How Much Stress Is in Your Life?

Put a tick in the "Happened" column if you have recently experienced the event described, then go back and count the number of ticks. Total your score.

Item No.	Happened ( )	Life Event
1.	_____	Death of spouse
2.	_____	Divorce
3.	_____	Marital separation
4.	_____	Jail term
5.	_____	Death of close family member
6.	_____	Personal injury or illness
7.	_____	Marriage
8.	_____	Loss of job
9.	_____	Marital reconciliation
10.	_____	Retirement
11.	_____	Change in health of family member
12.	_____	Pregnancy
13.	_____	Sexual difficulties
14.	_____	Gain of new family member
15.	_____	Business readjustment
16.	_____	Change in financial status
17.	_____	Death of close friend
18.	_____	Change to different line of work
19.	_____	Change in number of arguments with spouse or partner
20.	_____	Mortgage or loan over $10,000

21.	_____	Foreclosure of mortgage or loan
22.	_____	Change in responsibilities at work
23.	_____	Son or daughter leaving home
24.	_____	Trouble with in-laws or partner's family
25.	_____	Outstanding personal achievement
26.	_____	Spouse or partner begins or stops work
27.	_____	Beginning or ending work
28.	_____	Change in living conditions
29.	_____	Revision of personal habits
30.	_____	Trouble with boss or instructor
31.	_____	Change in work hours or conditions
32.	_____	Change in residence
33.	_____	Change in school or educational institution
34.	_____	Change in recreational activities
35.	_____	Change in church activities
36.	_____	Change in social activities
37.	_____	Mortgage or loan less than $10,000
38.	_____	Change in sleeping habits
39.	_____	Change in number of family social events
40.	_____	Change in eating habits
41.	_____	Vacation
42.	_____	Christmas
43.	_____	Minor violations of the traffic laws

Total Number of Ticks for 12 Months

The more change you have, the more likely you will suffer a decline in health. Of those who scored over 20 ticks, mostly in the top half of the table, 80% have a chance of a serious health change. With about 20 ticks distributed throughout the table, about 50% get sick in the near future. With less than half, but not more than a quarter, about 30% get sick in the near future.

TIME AND STRESS

The urgency of time drives most of us. Demands exceed the time available, and overloading means that the stress response is dangerously aroused. Irritability, impaired judgment, hypertension, headaches, and indigestion are frequent early signs of distress and potential illness. This is of crucial concern in the field of aviation, in which safety checks play a major role.

Chronic Overload: Do you:

Rush your speech?

Hurry or complete other people's speech?

Hurry when you eat?

Hate to wait in line?

Never seem to catch up?

Schedule more activities than you have time available?

Detest "wasting" time?

Drive too fast most of the time?

Often try to do several things at once?

Become impatient if others are too slow?

Have little time for relaxation, intimacy, or enjoying your environment?

Most of us go back and forth between such hurried behavior and a more relaxed schedule, but if you answered "yes" to most of the above, you may be suffering from chronic overload.

Overcommitment and Self-Imposed Obligations. A very natural behavior for many people is their inability to say "no" to requests. The consequence is frequently a great deal of stress generated by the subsequent awareness that the commitment cannot be met. Overcommitment also occurs when overzealous people obligate themselves when they know at the time that the likelihood of completing the task is remote.

Modern life imposes on our limited store of time powerful pressures to behave as though we were capable of doing several things at once. Much of our life stress comes from self-imposed obligations. Does yours?

STRESS AND FLYING

In flying, we must consider three classes of stressors: physical, physiological, and psychological.

Physical stressors include conditions associated with the environment, such as the temperature and humidity extremes, noise, vibration, and lack of oxygen often encountered in flight.

Physiological stressors include fatigue, lack of physical fitness, sleep loss, missed meals (which have led to a low blood sugar level), discomfort associated with a full bladder or bowel, and disease.

Psychological stressors are the social or emotional factors related to life stressors, which we dealt with earlier, or they may be precipitated by mental workload such as analyzing an aircraft problem in flight, or navigation.

When you need to consider only one thing at a time to reach a decision, you generally will have no difficulty making a decision. In flight, however, you will frequently have to deal with many situations simultaneously. Sometimes decisions are based on incomplete information within a short time period.

For example, in a cross-country flight, you may realize that you are much lower on fuel than you expected. The clouds ahead appear to be building, and there is considerable interference on the radio. You are off course and you cannot seem to find a familiar ground reference point. On top of this, you failed to take a comfort stop before the flight and you now have a full bladder. The cabin heater is not functioning properly, and you are now starting to encounter turbulence. You now have many things on your mind. You begin to worry about arriving at your destination on time. You begin to worry about a forced landing and damaging the aircraft.

Your palms are now beginning to become sweaty and your heart is starting to pound. You feel a growing tension, and your thinking is becoming confused and unfocused. You may give too much attention to the "what if" questions which should be ignored.

You are reaching, or have already reached, the overload state. It is inevitable that you will begin to make poor judgments that will result in a series of bad decisions. These might include pressing on into bad weather, or overflying good landing areas until you are almost out of fuel.

There can be plenty of stress to cope with in the flying environment itself without adding to them the burden of your life stressors. On the other hand, your life stressors may be sufficiently great already. That one poor (initial) judgment can lead to a dangerous compounding of stress-creating conditions. Stress effects are cumulative. They will eventually build to a point where the burden is intolerable unless you know how to cope.

STRESS AND PERFORMANCE

Let us review our major conclusions. Stress has a cumulative effect. Some degree of stress can be of assistance in some situations; however, stressors which persist over a long period can severely affect our performance and health. So, stress would seem to have a positive effect on performance when it is low. Performance will peak at an optimum level of stress, then decline as stress increases further.

Furthermore, complex or unfamiliar tasks require a higher level of performance than do simple or overlearned tasks. Complex and unfamiliar tasks also are adversely affected by increasing levels of stress.

In flying, accidents often occur when the task requirements exceed pilot capabilities, especially when stressors such as fatigue and emotional complications are involved.

COPING WITH STRESS

Up to this point, we have focused upon what stress is, and how it can affect us. Now we turn our attention to how we might best cope with stress.

By learning the goals and principles of coping, you can use stress constructively to promote good health, self-development, and flight safety.

As stated previously, stress is the product of an entire lifestyle. It is not merely the product of an occasional crisis. Consequently, each person must learn to monitor personal internal arousal levels and find ways to relieve stress. Health can be protected by using a constructive coping response to balance stress. For example, you can simply take a 5-minute break and relax.

Total Body Approach: The Wellness Concept. The total body approach takes account of six aspects of well-being:

1. Physiological.
2. Nutritional.
3. Environmental.
4. Emotional.
5. Spiritual.
6. Lifestyle values.

What you do in one of these areas supports, enhances, and capitalizes on actions in other areas.

For instance, poor eating habits may increase your stress level, leading to weight problems and lack of vitality. This lack of energy may slow down productivity and lead to increased pressure at home and at work to get things done. The pressure can lower your self-esteem or defensive behaviors, thus throwing your entire lifestyle out of balance and increasing your stress to unhealthy levels.

Behaviors consistent with good health and low stress are:

1. Minimizing or stopping activities detrimental to your health, such as smoking or drinking to excess.
2. Increasing health-producing behavior, such as relaxing at regular intervals.
3. Using self-regulation and self-control information, such as appropriate time management and thought-stopping (deliberately stopping yourself from thinking negatively).
4. Being trained in health promotion strategies and technologies. These would include simple techniques such as "time out" (a 5-minute shutdown when you recognize that stress is increasing--you can do this quite effectively in your workplace by taking the phone off the hook if you need to solve one problem at a time), or more involved tecnniques which require formal training such as self-hypnosis and biofeedback.
5. Accepting responsibility for your own health, such as developing a stress reduction program.

Coping Responses

People who get along well in life can respond to any given situation with appropriate behavior. Coping behaviors include a variety of both desirable and undesirable responses:

1. Emotional - humor, anger, sadness, excitement;

2. Personal habits - eating, smoking, sex, physical activity, drinking;

3. Unconscious habits - nail biting, sighing, finger drumming;

4. Absorption in job, family, or hobby.

Flexibility and a range of creative coping behaviors enable people to handle considerable stress. A limited coping repertoire may be harmful. For instance, if eating or drinking is the primary coping response to stress, obesity or alcoholism is likely to present its own problems. It is a bad idea to use "addictive" solutions to handle life stressors. Other potentially destructive responses include violence, procrastination, drug abuse, overwork, poor sleeping habits (sleep disorder), compulsive spending sprees, total withdrawal, and caustic remarks. They make a problem worse or initiate a new one rather than solving anything.

Complete the following guide for stress reduction.

IMPROVING MY EXTERNAL ENVIRONMENT

1. One way I can reduce unnecessary noise and irritations around me is to:

2. The amount of sleep I need each day in order to be maximally alert and able to cope with stress is:

3. I presently get that amount of sleep or rest.

   Yes_____ No_____

4. (For those who answered No to #3):

   A way I could rearrange my schedule in order to get enough sleep is:

5. Some changes or crises I foresee over the next year are:

6. Ways I can deal with these stresses are:

COPING WITH JOB STRESS

1. Identify the kinds of stress you experience.

   When does it occur?

   How frequently?

   Who or what is involved?

   Any bad habits involved?

2. Prioritize those job stresses which bother you most. Choose one to work on first.

3. Review coping methods you have tried and assess their success/failure.

4. Consider possible solutions.

   Which can be implemented with most ease?

   Who can help with implementation?

JOB STRESS PROFILE

1. Some sources of job stress for me are:

2. Clues that reveal to myself and others that job stress is an important stress factor in my life:

3. How I now cope with job stress:

4. Some ideas or new ways I want to try in order to cope with job stress:

5. One step I will take on the next work day to reduce job stress for me:

25 Ways of Combatting Job Stress

Here are some ways that have been suggested to cope with job stress. Which can be applied in flying? Begin with the easier ones first to build your confidence before you embark on a more ambitious program of changes.

1. Start off your day with breakfast.
2. Occasionally change your routine by meeting a friend or co-worker for breakfast--allow enough time to really enjoy it.
3. Avoid drinking coffee or soft drinks all day; drink water or fruit juice instead.
4. Organize your work--set priorities.
5. Write it down; don't overburden your memory.
6. Don't try to be perfect, doing everything right at all times.
7. Don't try to do two, three or more things at once.
8. Consider occasionally coming in earlier or staying later instead of taking your work home with you every night.
9. Reduce the noise level if possible.
10. Restrict telephone calls by having them held, or close the door when you are extra busy or need to concentrate.
11. Consider planning to use uninterrupted blocks of time.
12. Create a pleasant work environment in your immediate surroundings.
13. Speak up about petty annoyances, but respect the other's feelings.
14. Develop co-worker support networks. Can peak workloads be shared?
15. Don't take your job with you on breaks.
16. Take a lunch break away from work.
17. Occasionally go out to lunch with a co-worker or friend.
18. Take a 10- or 20-minute meditation break during lunch hour, or a yoga or exercise break.
19. Optimize your health with good nutrition, exercise, sleep and rest.

20. Monitor the balance between work, rest, and recreation. Are changes needed?

21. Develop with co-workers your own brand of happy hour, or celebrate birthdays or other events as a break in the routine.

The following suggestions require more effort but will have long-term payoffs:

22. Develop a wider variety of sources of gratification in your life--family, friends, hobbies, interests. Plan occasional special weekends or mini-vacations.

23. Consider changing your job or having your job responsibilities changed to better meet your interests and skills.

24. Be assertive; learn how to express differences, make requests and say "no" constructively. Consider taking a course in assertiveness training.

25. Don't overlook the emotional resources available to you that are close at hand--co-workers, supervisor, spouse, friends. This suggestion needs to be underscored for the male sex, who are programmed by society to avoid discussing or acknowledging feelings and problems, but pay for it in terms of stress-related diseases.

COPING WITH STRESS WHILE FLYING

1. Identify the kinds of stress you experience.

   When does it occur?

   How frequently?

   Under what conditions does it occur?

   Are any bad habits involved? (Refer to the five hazardous thoughts).

2. Prioritize those stresses which concern you most.

   Choose one to work on first.

3. Review coping methods you have tried, and assess their success/failure.

4. Consider possible solutions:

   Which can be implemented with most ease?

   Who can help with implementation?

From the 25 ways of combatting stress listed above, write those you can use to advantage (perhaps in an adapted form).

Making Go/No Go Decisions Before a Flight

It is part of good safety procedures that you give your aircraft a thorough preflight inspection. Most pilots forget, however, that because they are in control of a machine, they are well advised to give themselves an equally thorough preflight inspection. The I'M SAFE CHECKLIST is one way of doing this. You'll find the I'M SAFE CHECKLIST at the end of this manual; but first, here are some specific suggestions.

1. Before you make a flight, limit your intake of liquids, especially caffeine--it acts as a diuretic. Drinking coffee has become a regular part of our working lives, but it has some serious short-term and long-term effects. Too much caffeine can cause headaches, irritability, sleeplessness, and heart problems. Six cups of instant (or four cups of percolated) coffee a day is considered by health authorities to be the allowable maximum.

2. Never fly when you are angry or emotionally upset.

3. Never get into a situation where you must get to your destination at all cost.

4. YOU ALONE are pilot-in-command and YOU ALONE make the GO or NO GO DECISION.

Cockpit Stress Management

Avoid situations that distract you from flying the aircraft. If you feel tension mounting, here are some things you can do:

Loosen your collar;

Stretch your arms and legs;

Open air vents;

Don't hesitate to ask controllers to help--for instance, to speak more slowly or to give you a position fix (this is of extreme importance if you are not sure of your position);

Don't hesitate to declare an emergency when necessary or let other people know about your situation. Don't delay until it is too late!

Spend a few minutes with your instructor and jot down some other suggestions for reducing tension or anxiety while in flight.

The point is to reduce your workload to reduce stress levels and provide yourself with the proper environment in which to make sound judgments. If an emergency does occur, be calm--think for a moment, weigh the alternatives, then act. Remember that fear and panic are your greatest enemies during an in-flight emergency.

Your greatest tool for combatting fear and panic is to familiarize yourself thoroughly with your aircraft, its systems, and emergency procedures, along with the navigation/communications frequencies along your route of flight. Above all, maintain proficiency in your aircraft, for proficiency builds confidence. Know and respect your own personal limits. Give yourself plenty of leeway or an "out" when needed. Always have a "plan" and an "alternate plan"--leave yourself an out! Plan stops to allow adequate time for rest, for meals, and to stretch your legs.

Another situation that may generate stress involves letting little mistakes bother you until they build into a "big thing." If you make a mistake which you detect and correct, the most sensible thing to do is to forget about it and return your entire attention to flying. Don't keep thinking, "Why did I do that? How could I have been so stupid? Where did I go wrong? What happens if I do it again?" If you do this, your mental energies and attention will be distracted from the job of flying. Wait until after you land, then "debrief" and analyze past actions.

ARE YOU FIT TO FLY?

THE "I'M SAFE" CHECKLIST

I LLNESS	Do I have any symptoms?
M EDICATION	Have I been taking prescription or over-the-counter drugs?
S TRESS	Am I under psychological pressure from the job? Am I under physical stress? Am I worried about financial matters, health problems, or family discord?
A LCOHOL	Have I been drinking or using non-prescribed drugs within eight hours before the flight? Within 24 hours?
F ATIGUE	Am I tired and not adequately rested?
E ATING	Am I adequately nourished?